

Technical University Berlin

Telecommunication Networks Group

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Bit Error Rate Measurements - Second  
Campaign, **longterm2** measurement

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Berlin, November 2000

TKN Technical Report TKN-00-010

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TKN Technical Reports Series

Editor: Prof. Dr.-Ing. Adam Wolisz

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## Chapter 1

# Introduction

In this report we document partly the results of the **longterm2** measurement, part of the second measurement campaign in the PTZ Berlin. The other measurements of this campaign (**longterm1** and **factorial** measurements) are covered in companion reports [2], [1]. The report [2] contains also further information about the measurement setup. Our overall conclusions are contained in an upcoming report, which should be read first [3].

The **longterm2** measurement started at 9.28 AM and stopped at 13.50 PM on Aug. 29 of 2000. The portal crane was active most of the time. On every day, we have started the measurements with half an hour of dummy measurements, in order to “warm up” the equipment. The results of these dummy measurements were discarded. The measurement setup is shown in figure 1.1.

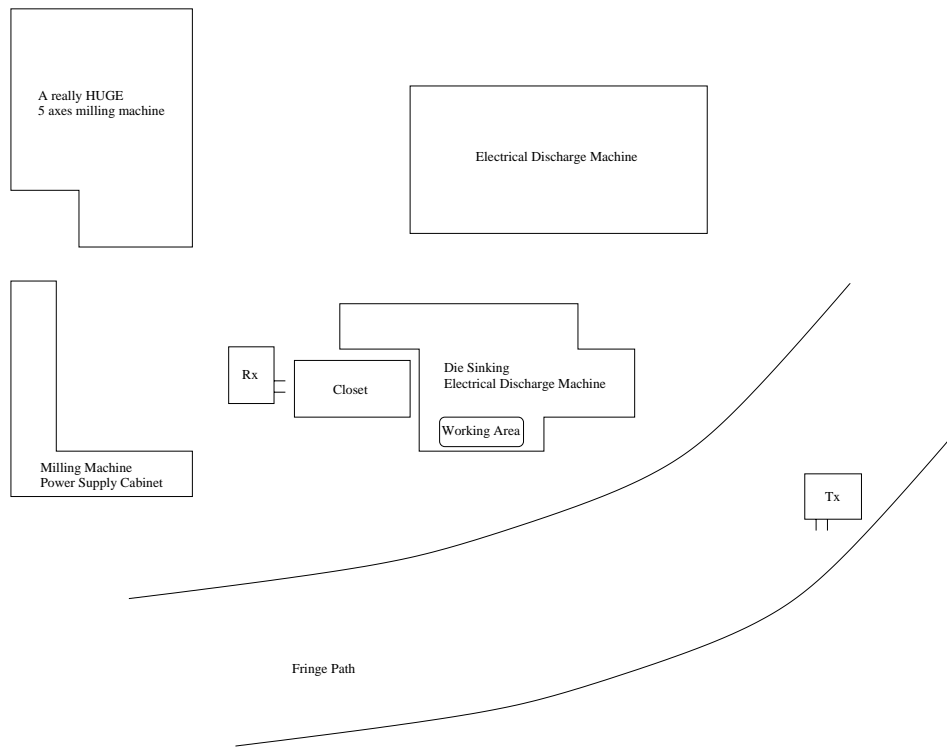


Figure 1.1: Setup of PTZ measurement

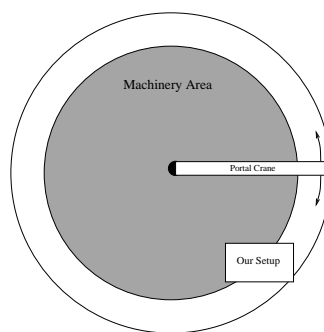


Figure 1.2: Position of our Setup within the Building

## Chapter 2

# Results

### 2.0.1 Judging our Measurement Equipment

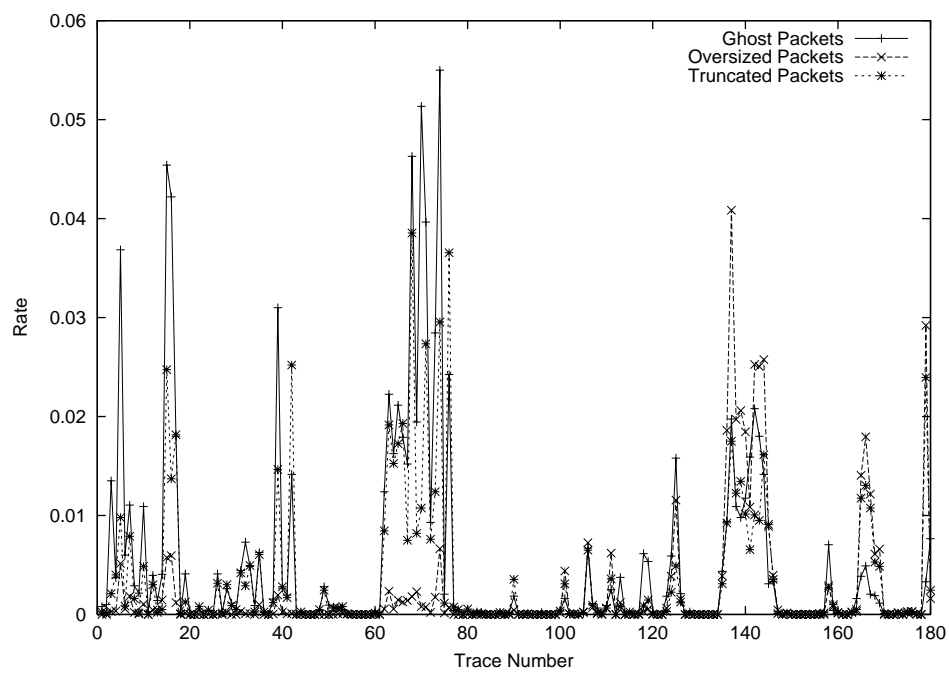


Figure 2.1: Rates of ghost packets, oversized packets and truncated packets vs. trace number for **longterm2** measurement

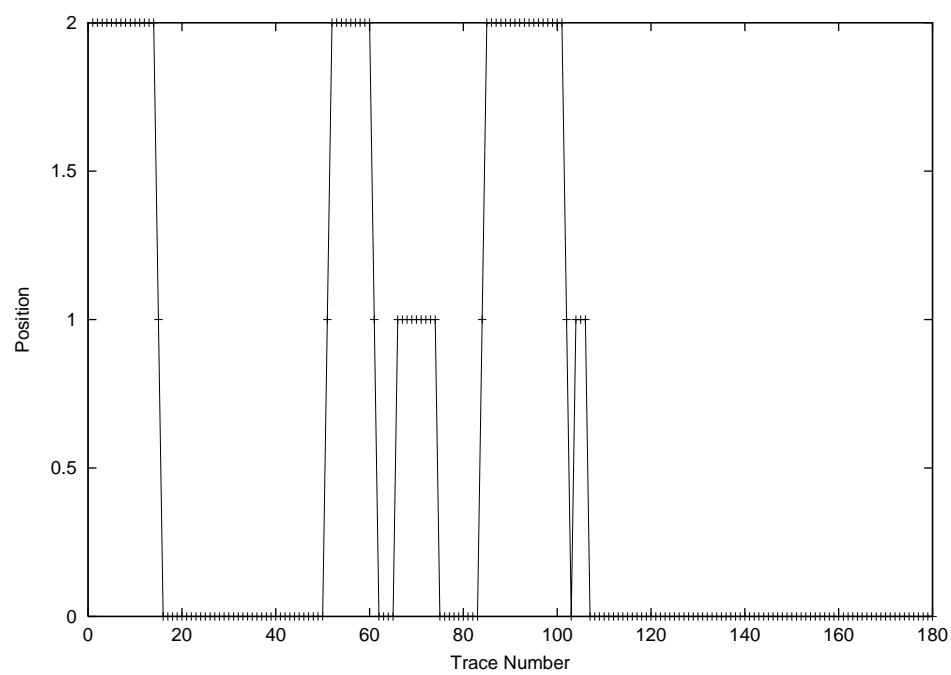


Figure 2.2: Position of portal crane (0=close proximity, 1=short distance, 2=longer distance) for **longterm2** measurement

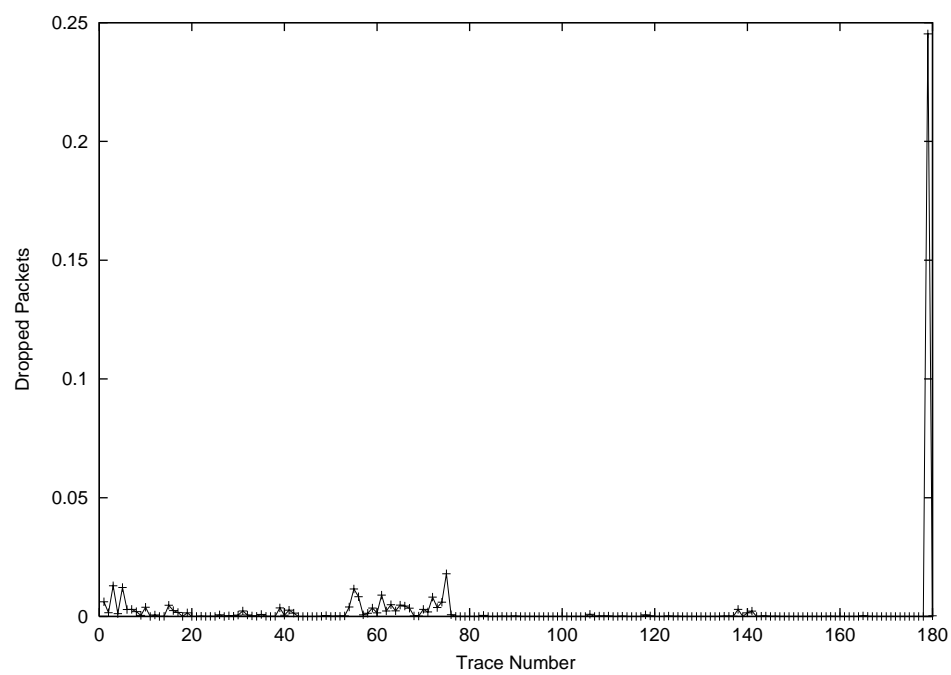
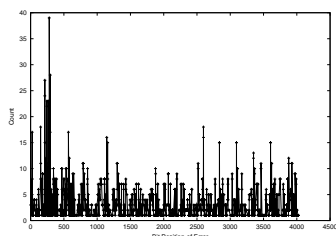
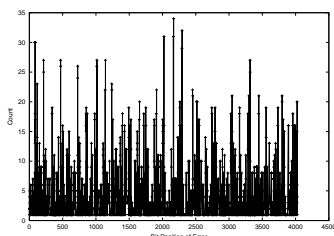


Figure 2.3: Rate of packets dropped due to more than 10% erroneous bits vs. trace number for **longterm2** measurement

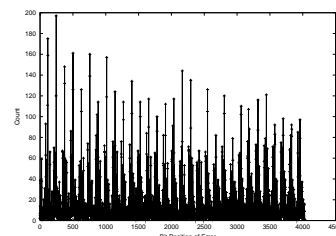




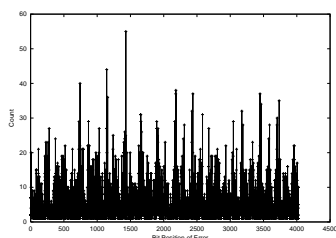
Trace 1,  $E_k = 0.000044$



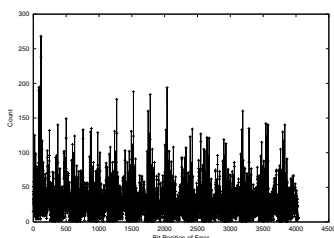
Trace 2,  $E_k = 0.000098$



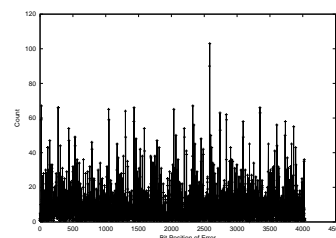
Trace 3,  $E_k = 0.000638$



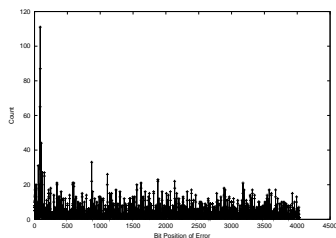
Trace 4,  $E_k = 0.000225$



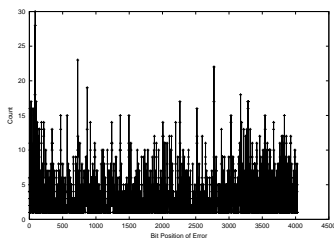
Trace 5,  $E_k = 0.001656$



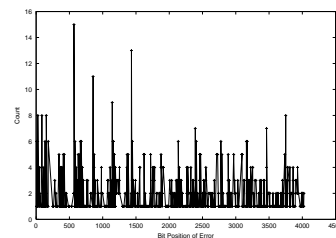
Trace 6,  $E_k = 0.000378$



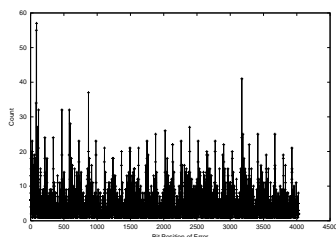
Trace 7,  $E_k = 0.000122$



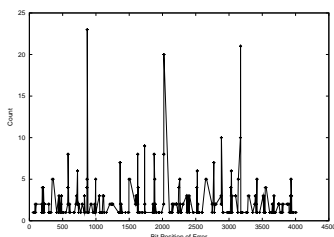
Trace 8,  $E_k = 0.000110$



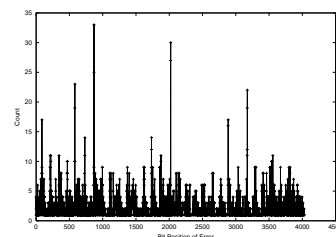
Trace 9,  $E_k = 0.000018$



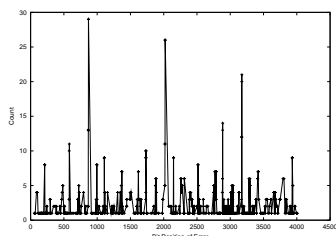
Trace 10,  $E_k = 0.000205$



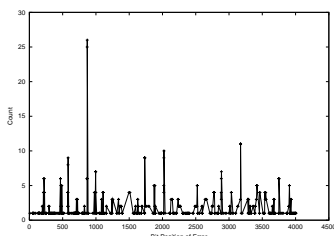
Trace 11,  $E_k = 0.000015$



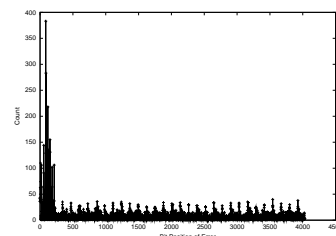
Trace 12,  $E_k = 0.000091$



Trace 13,  $E_k = 0.000025$

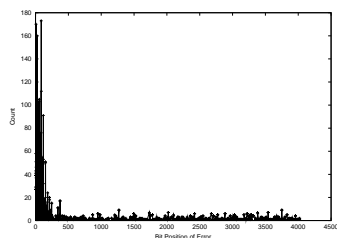


Trace 14,  $E_k = 0.000014$

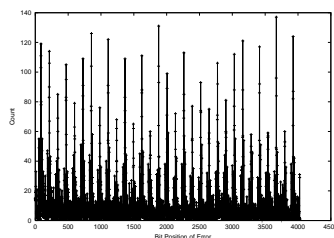


Trace 15,  $E_k = 0.000350$

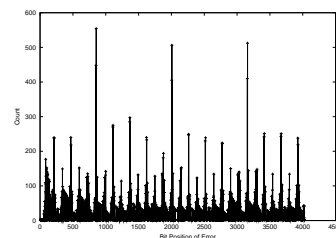
Table 2.1: Positions of Bit Errors, Traces 1 to 15 for **longterm2** measurement



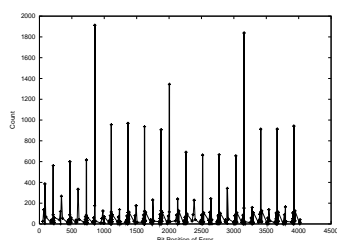
Trace 16,  $E_k = 0.000076$



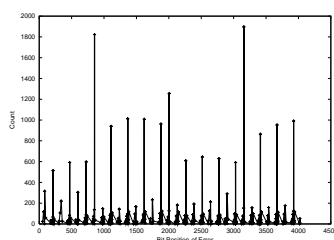
Trace 17,  $E_k = 0.000544$



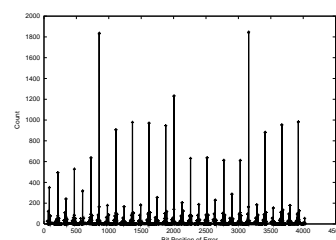
Trace 19,  $E_k = 0.000882$



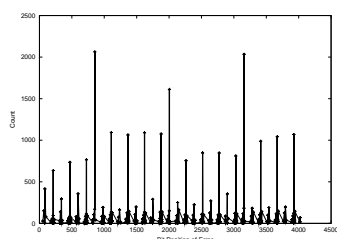
Trace 20,  $E_k = 0.000707$



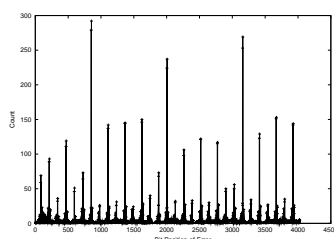
Trace 21,  $E_k = 0.000686$



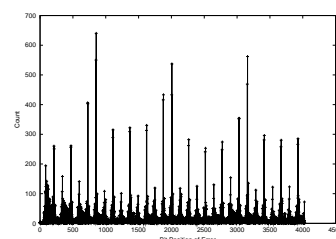
Trace 22,  $E_k = 0.000727$



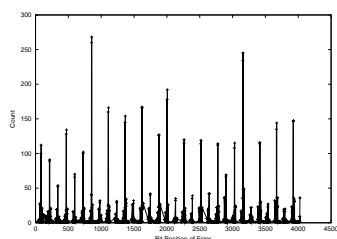
Trace 23,  $E_k = 0.000827$



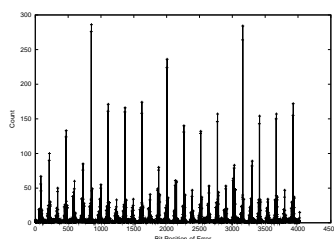
Trace 24,  $E_k = 0.000153$



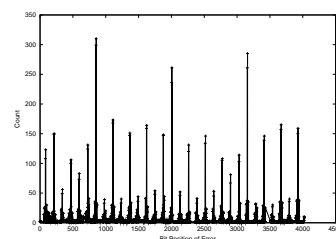
Trace 26,  $E_k = 0.000753$



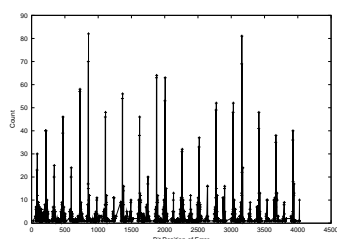
Trace 27,  $E_k = 0.000150$



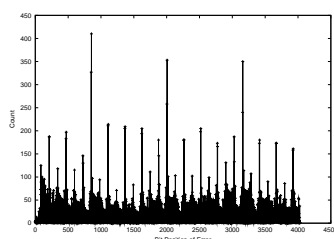
Trace 28,  $E_k = 0.000229$



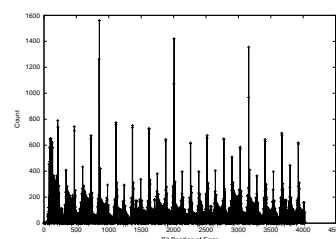
Trace 29,  $E_k = 0.000208$



Trace 30,  $E_k = 0.000061$

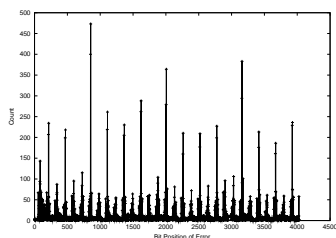


Trace 31,  $E_k = 0.000914$

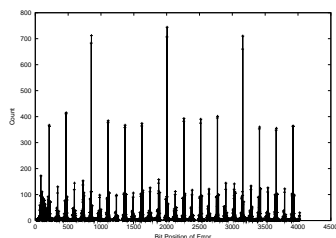


Trace 32,  $E_k = 0.002796$

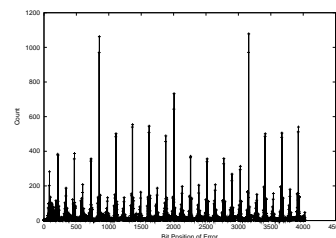
Table 2.2: Positions of Bit Errors, Traces 16 to 32 for **longterm2** measurement



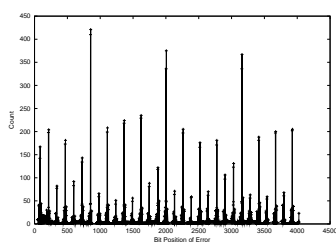
Trace 33,  $E_k = 0.000451$



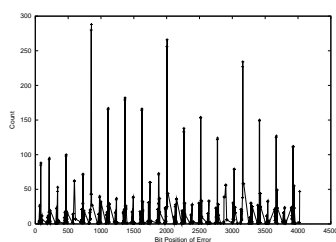
Trace 34,  $E_k = 0.000488$



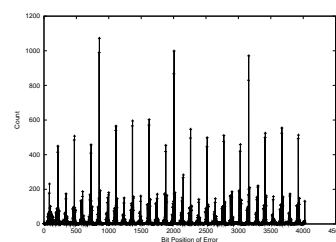
Trace 35,  $E_k = 0.000899$



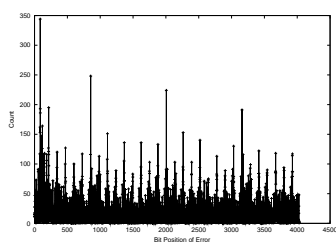
Trace 36,  $E_k = 0.000249$



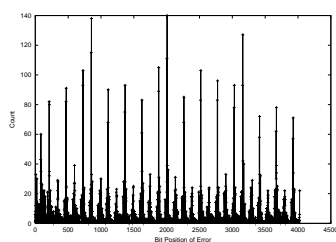
Trace 37,  $E_k = 0.000140$



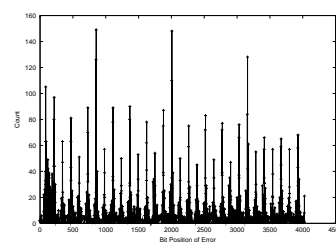
Trace 38,  $E_k = 0.000712$



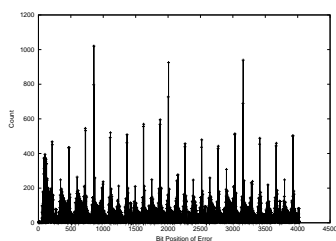
Trace 39,  $E_k = 0.001082$



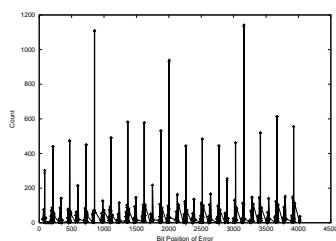
Trace 40,  $E_k = 0.000180$



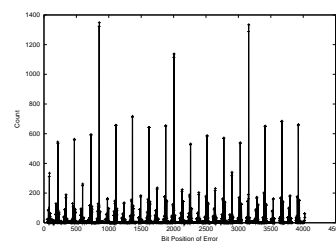
Trace 41,  $E_k = 0.000218$



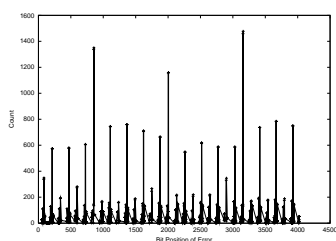
Trace 42,  $E_k = 0.002057$



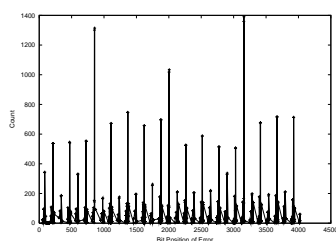
Trace 43,  $E_k = 0.000536$



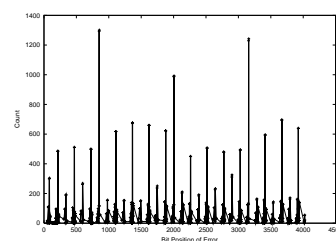
Trace 44,  $E_k = 0.000715$



Trace 45,  $E_k = 0.000704$

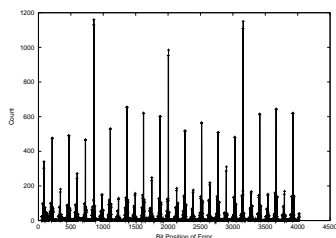


Trace 46,  $E_k = 0.000667$

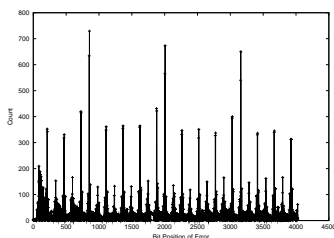


Trace 47,  $E_k = 0.000614$

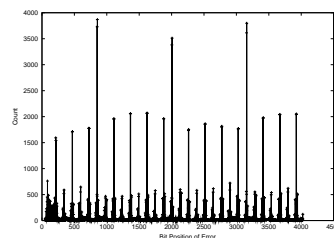
Table 2.3: Positions of Bit Errors, Traces 33 to 47 for **longterm2** measurement



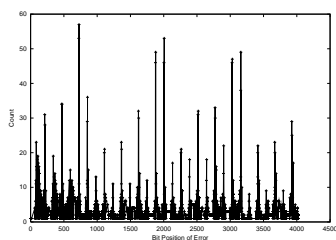
Trace 48,  $E_k = 0.000670$



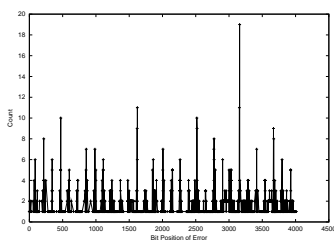
Trace 49,  $E_k = 0.000922$



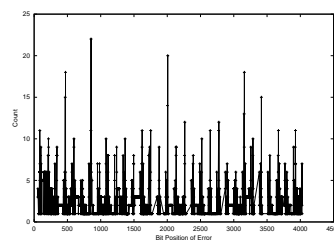
Trace 50,  $E_k = 0.002404$



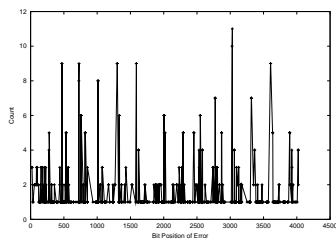
Trace 51,  $E_k = 0.000087$



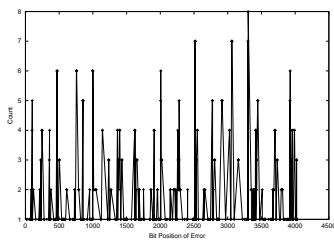
Trace 52,  $E_k = 0.000025$



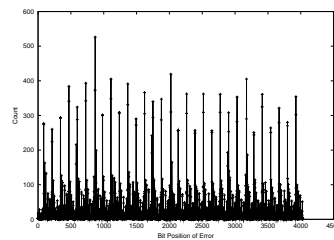
Trace 53,  $E_k = 0.000048$



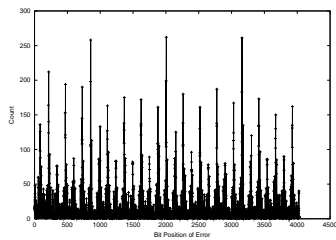
Trace 60,  $E_k = 0.000012$



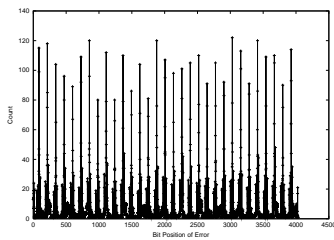
Trace 61,  $E_k = 0.000010$



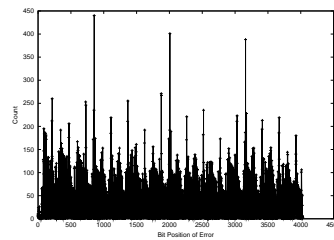
Trace 62,  $E_k = 0.001059$



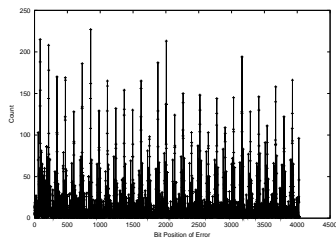
Trace 63,  $E_k = 0.000757$



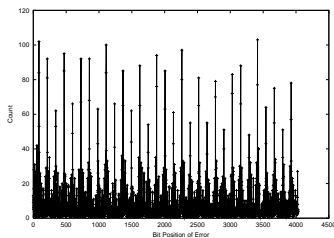
Trace 64,  $E_k = 0.000325$



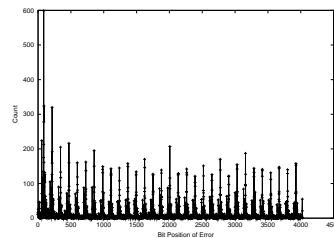
Trace 65,  $E_k = 0.001939$



Trace 66,  $E_k = 0.000733$

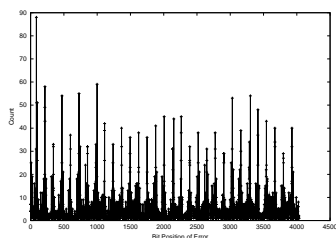


Trace 67,  $E_k = 0.000370$

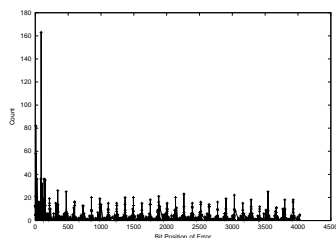


Trace 68,  $E_k = 0.000623$

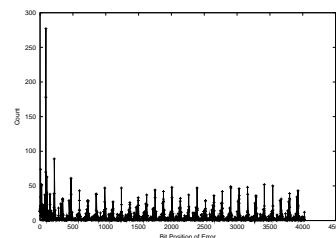
Table 2.4: Positions of Bit Errors, Traces 48 to 68 for **longterm2** measurement



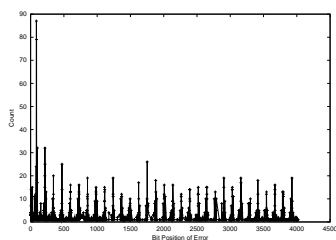
Trace 69,  $E_k = 0.000206$



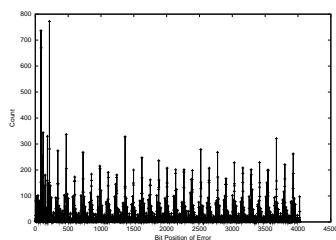
Trace 70,  $E_k = 0.000052$



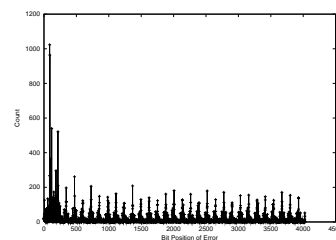
Trace 71,  $E_k = 0.000119$



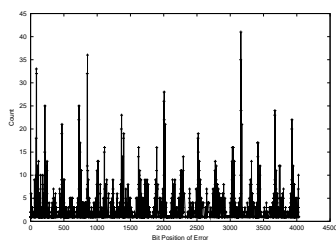
Trace 72,  $E_k = 0.000048$



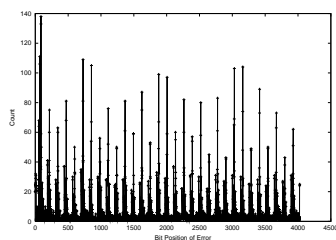
Trace 73,  $E_k = 0.000824$



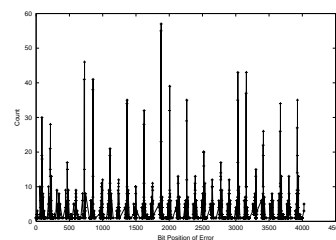
Trace 74,  $E_k = 0.000751$



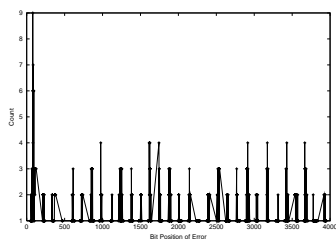
Trace 75,  $E_k = 0.000072$



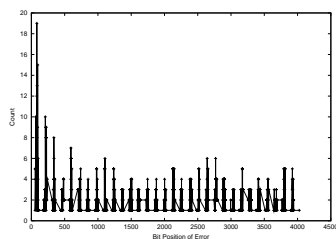
Trace 76,  $E_k = 0.000271$



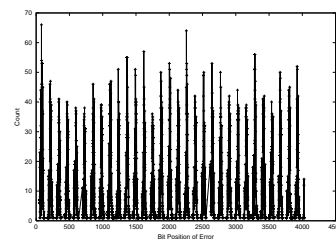
Trace 90,  $E_k = 0.000058$



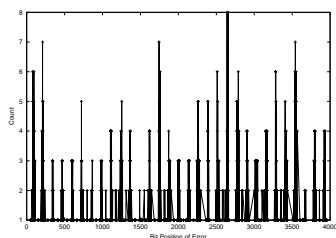
Trace 93,  $E_k = 0.000013$



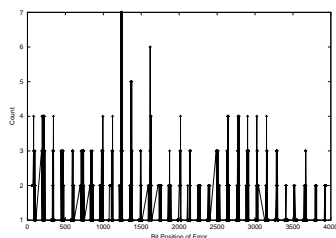
Trace 100,  $E_k = 0.000023$



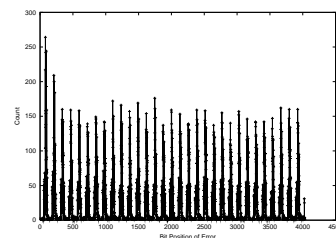
Trace 101,  $E_k = 0.000344$



Trace 102,  $E_k = 0.000025$

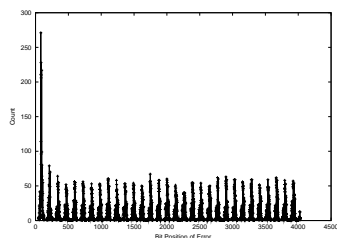


Trace 105,  $E_k = 0.000014$

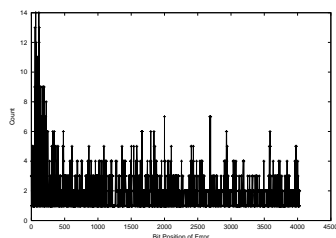


Trace 106,  $E_k = 0.001115$

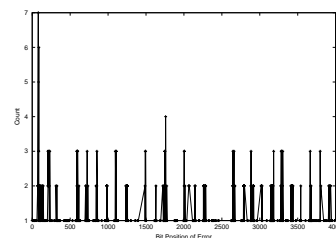
Table 2.5: Positions of Bit Errors, Traces 69 to 106 for **longterm2** measurement



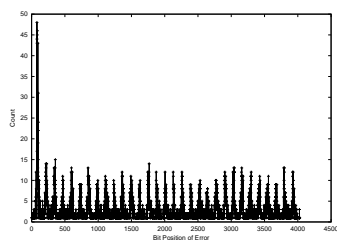
Trace 107,  $E_k = 0.000456$



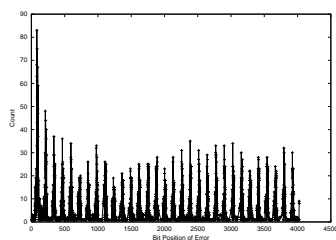
Trace 108,  $E_k = 0.000052$



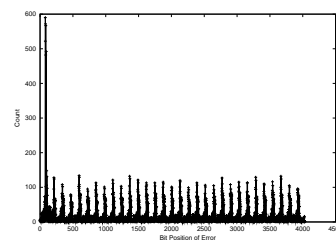
Trace 109,  $E_k = 0.000011$



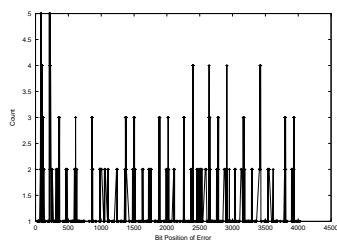
Trace 110,  $E_k = 0.000125$



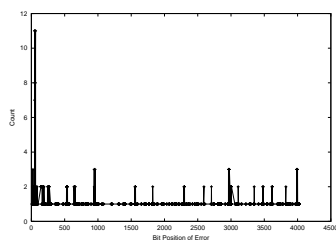
Trace 111,  $E_k = 0.000196$



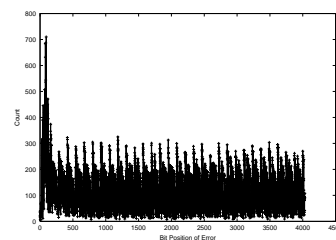
Trace 113,  $E_k = 0.000887$



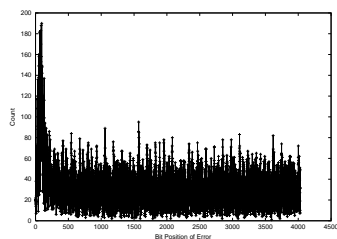
Trace 115,  $E_k = 0.000015$



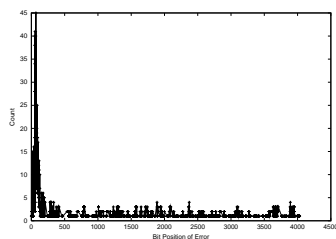
Trace 117,  $E_k = 0.000011$



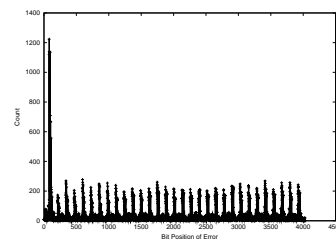
Trace 118,  $E_k = 0.007468$



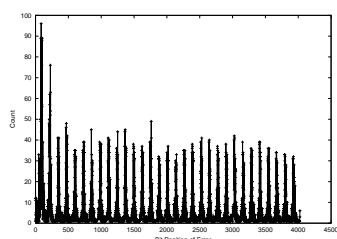
Trace 119,  $E_k = 0.001822$



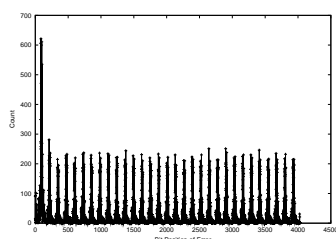
Trace 120,  $E_k = 0.000037$



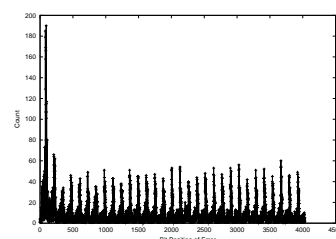
Trace 123,  $E_k = 0.002177$



Trace 124,  $E_k = 0.000306$

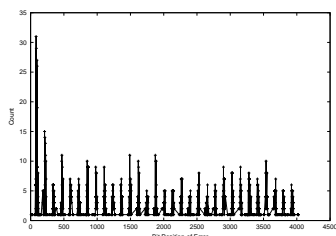


Trace 125,  $E_k = 0.001784$

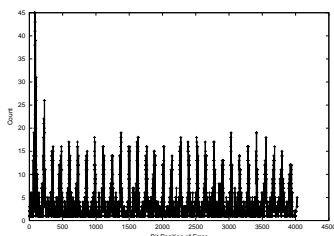


Trace 126,  $E_k = 0.000485$

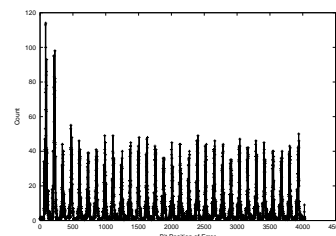
Table 2.6: Positions of Bit Errors, Traces 107 to 126 for **longterm2** measurement



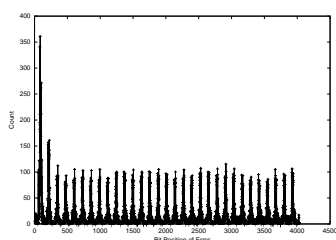
Trace 128,  $E_k = 0.000035$



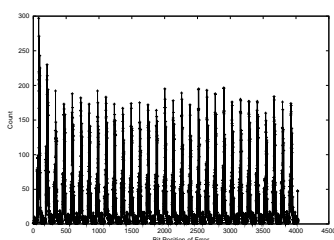
Trace 135,  $E_k = 0.000165$



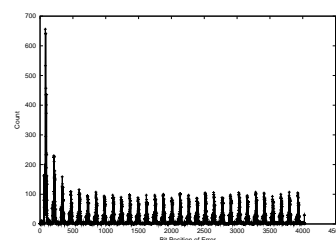
Trace 136,  $E_k = 0.000393$



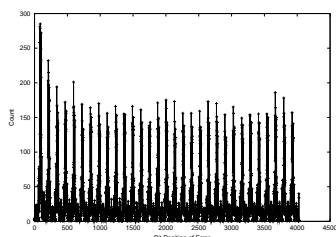
Trace 137,  $E_k = 0.000952$



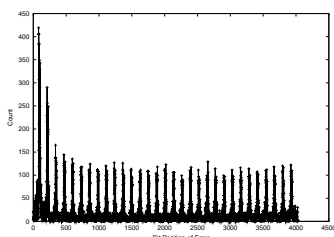
Trace 138,  $E_k = 0.001518$



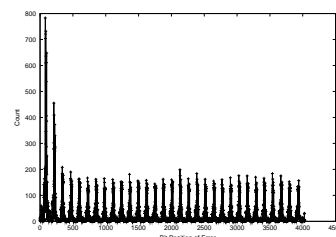
Trace 139,  $E_k = 0.000880$



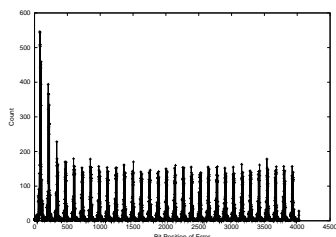
Trace 140,  $E_k = 0.001546$



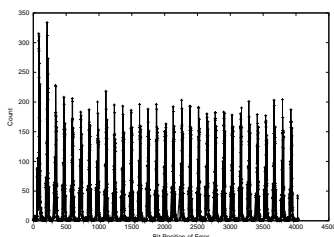
Trace 141,  $E_k = 0.001141$



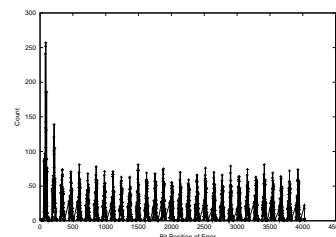
Trace 142,  $E_k = 0.001547$



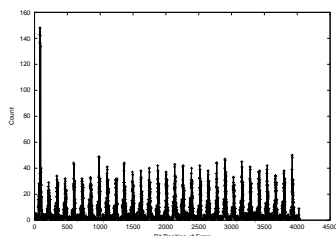
Trace 143,  $E_k = 0.001243$



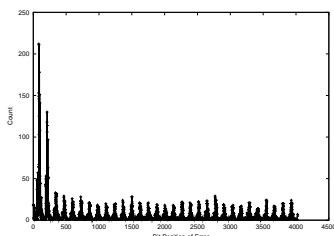
Trace 144,  $E_k = 0.001552$



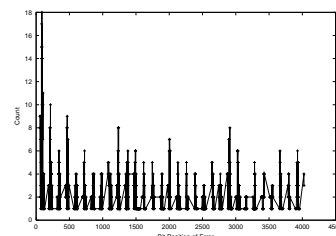
Trace 145,  $E_k = 0.000572$



Trace 146,  $E_k = 0.000306$

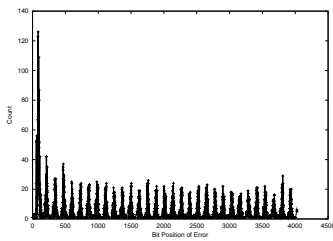


Trace 158,  $E_k = 0.000233$

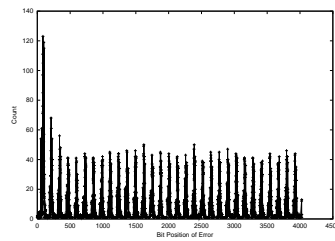


Trace 159,  $E_k = 0.000029$

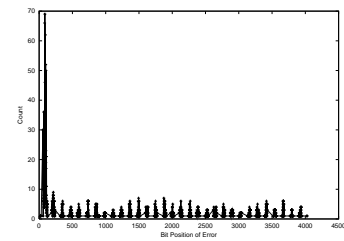
Table 2.7: Positions of Bit Errors, Traces 128 to 159 for **longterm2** measurement



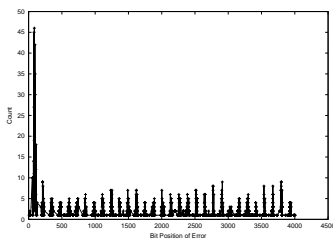
Trace 165,  $E_k = 0.000207$



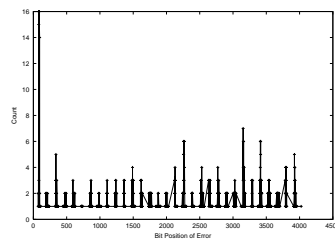
Trace 166,  $E_k = 0.000369$



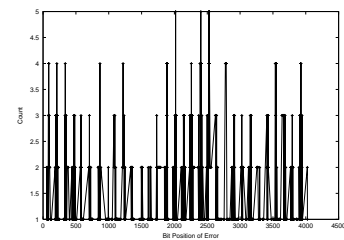
Trace 167,  $E_k = 0.000036$



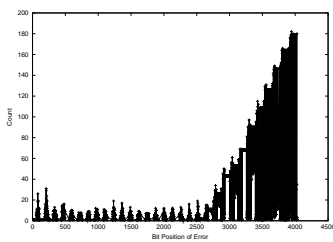
Trace 168,  $E_k = 0.000042$



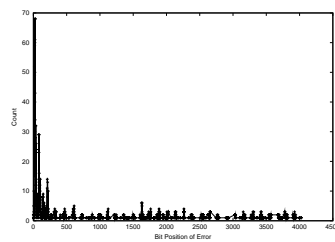
Trace 175,  $E_k = 0.000016$



Trace 176,  $E_k = 0.000018$



Trace 179,  $E_k = 0.000799$



Trace 180,  $E_k = 0.000036$

Table 2.8: Positions of Bit Errors, Traces 165 to 180 for **longterm2** measurement



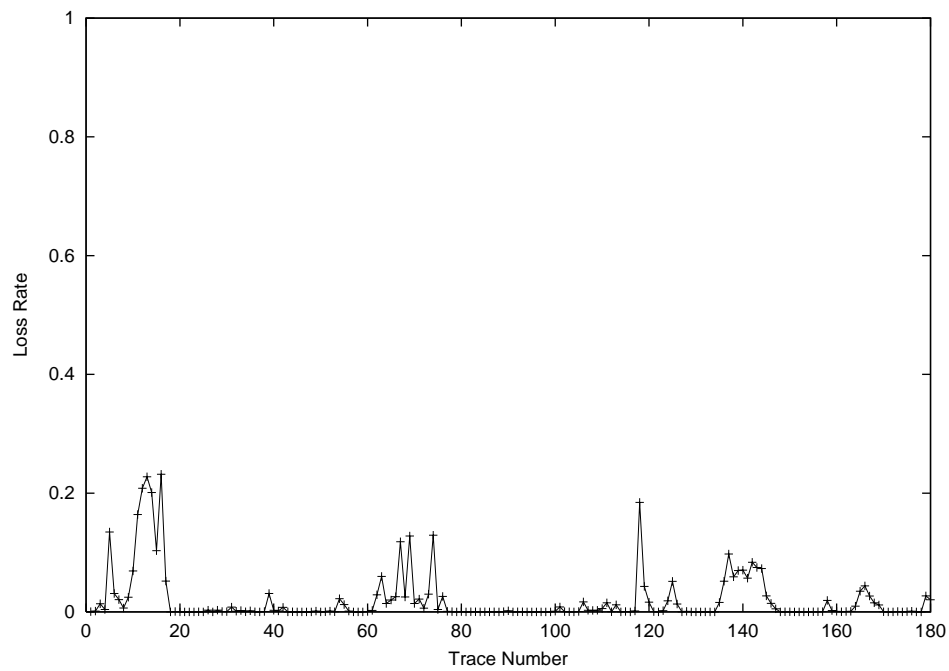


Figure 2.4: Rates of lost packets for **longterm2** measurement

## 2.0.2 First Order Statistics

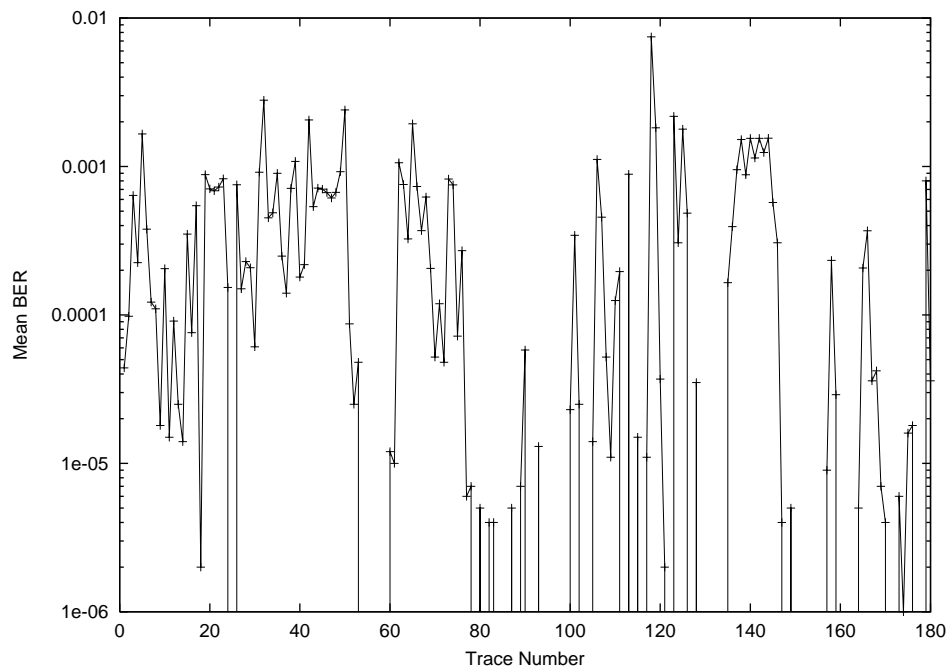


Figure 2.5: Mean bit error rates vs. trace number for **longterm2** measurement

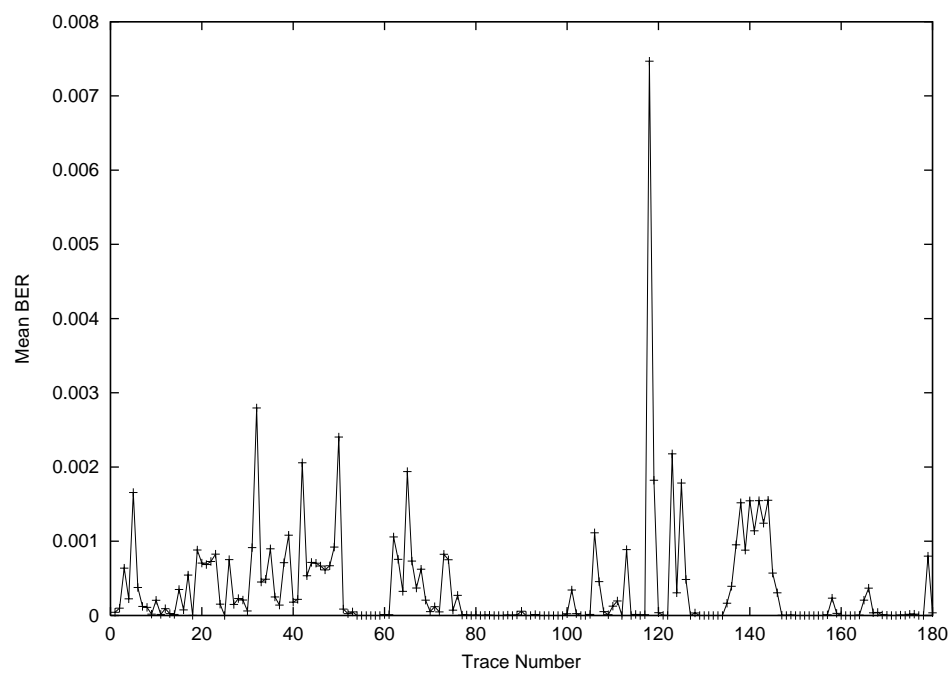


Figure 2.6: Mean bit error rates vs. trace number for **longterm2** measurement (nonlogarithmic scale)

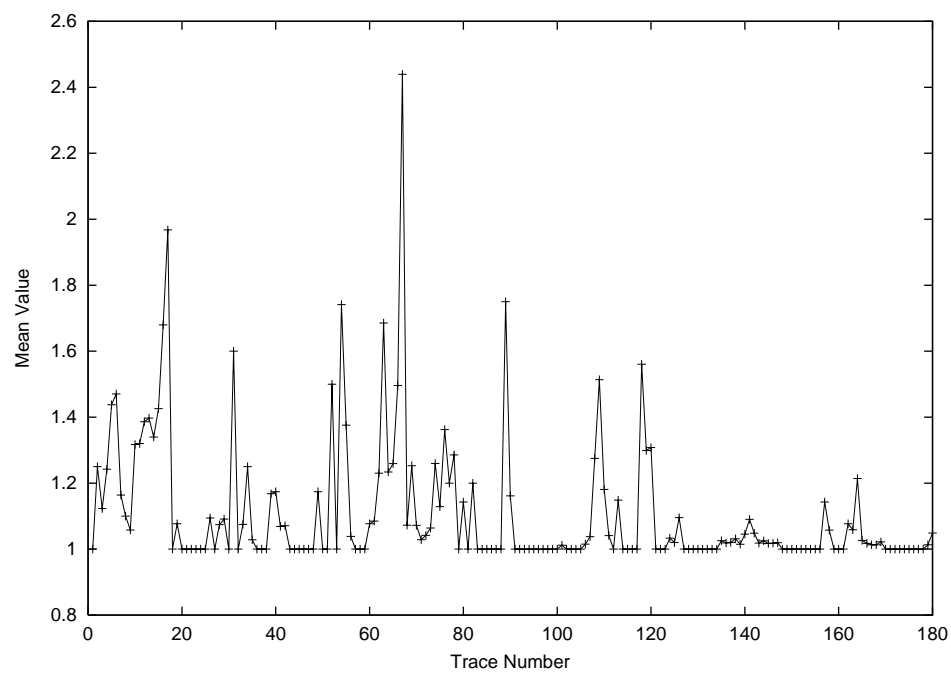


Figure 2.7: Mean packet loss burst lengths vs. trace number for **longterm2** measurement and burst order  $k_0 = 1$ .

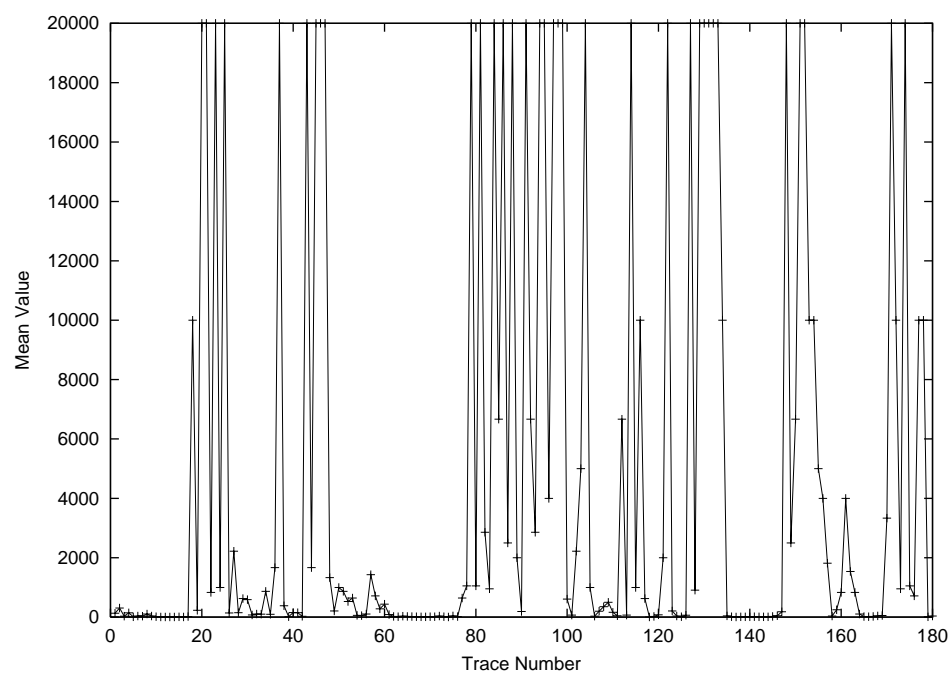


Figure 2.8: Mean packet loss free burst lengths vs. trace number for **longterm2** measurement and burst order  $k_0 = 1$ .

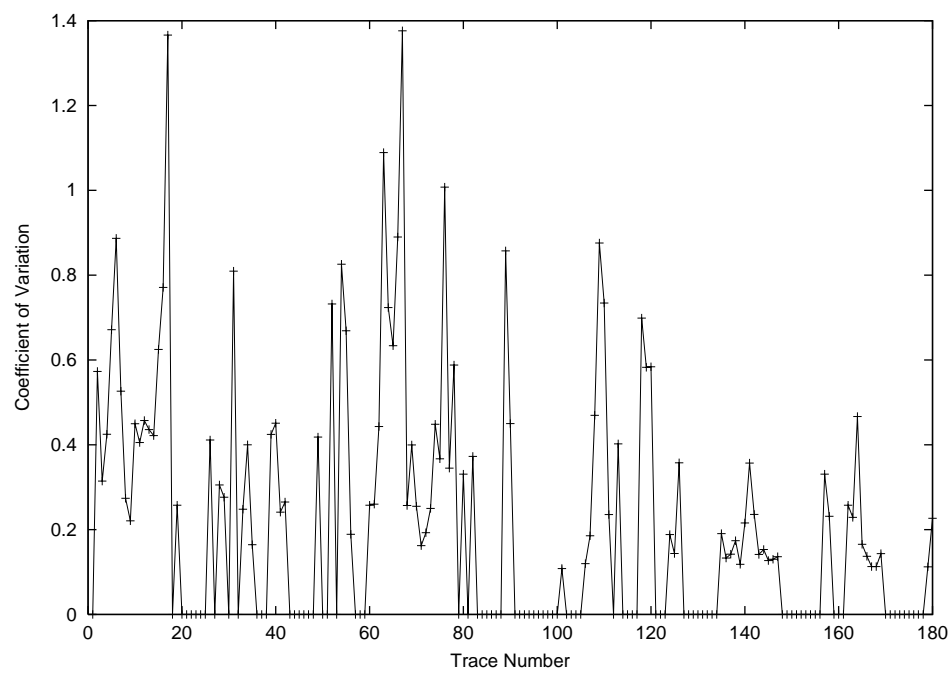


Figure 2.9: Coefficient of Variation of packet loss burst lengths vs. trace number for **longterm2** measurement and burst order  $k_0 = 1$ .

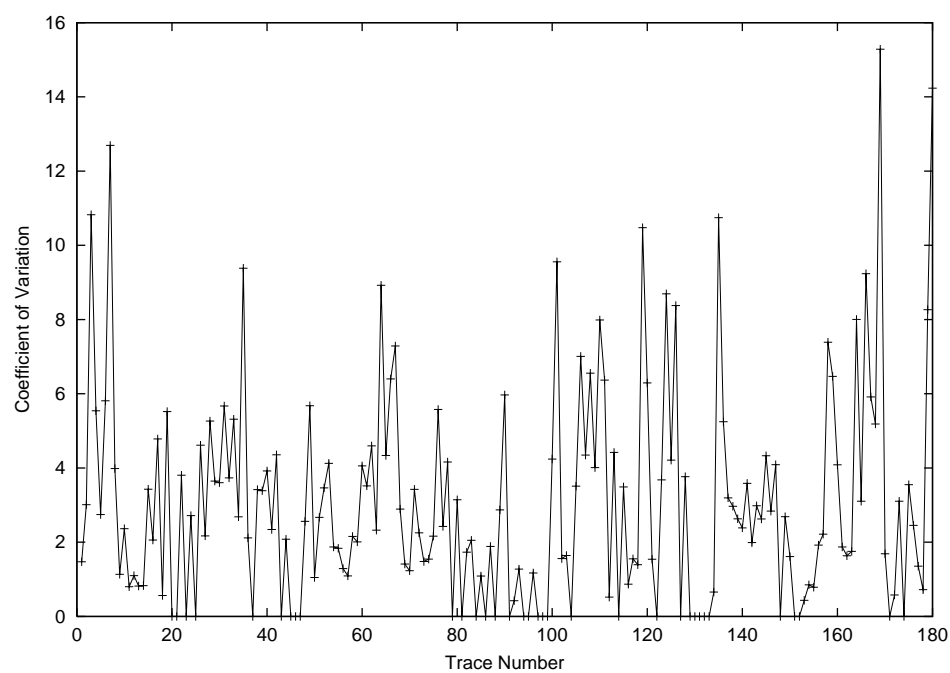


Figure 2.10: Coefficient of Variation of packet loss free burst lengths vs. trace number for **longterm2** measurement and burst order  $k_0 = 1$ .

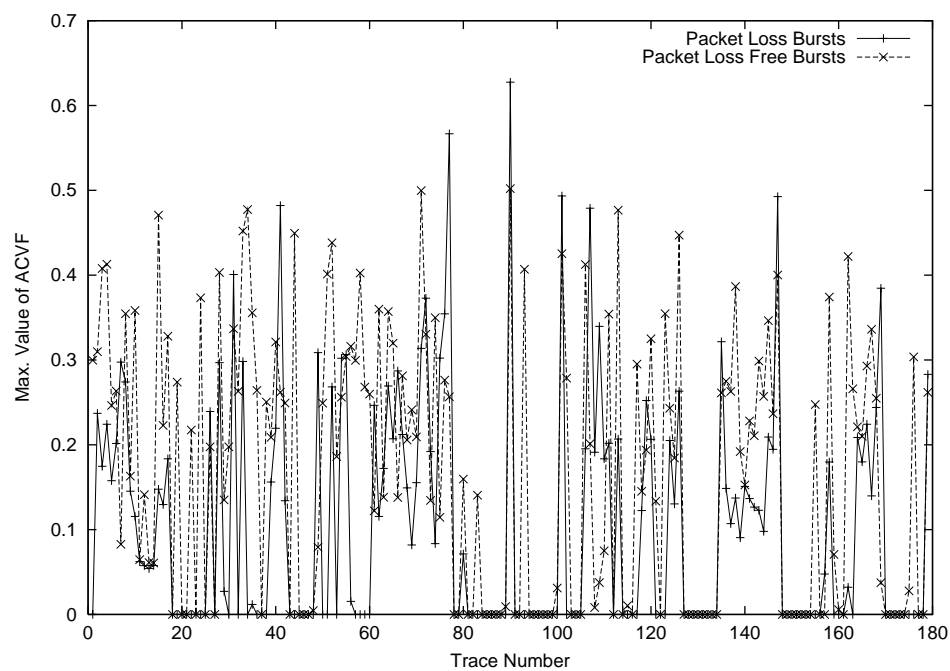


Figure 2.11: Max. values of autocovariance function for packet loss burst lengths and packet loss free burst lengths vs. trace number for **longterm2** measurement and  $k_0 = 1$ .



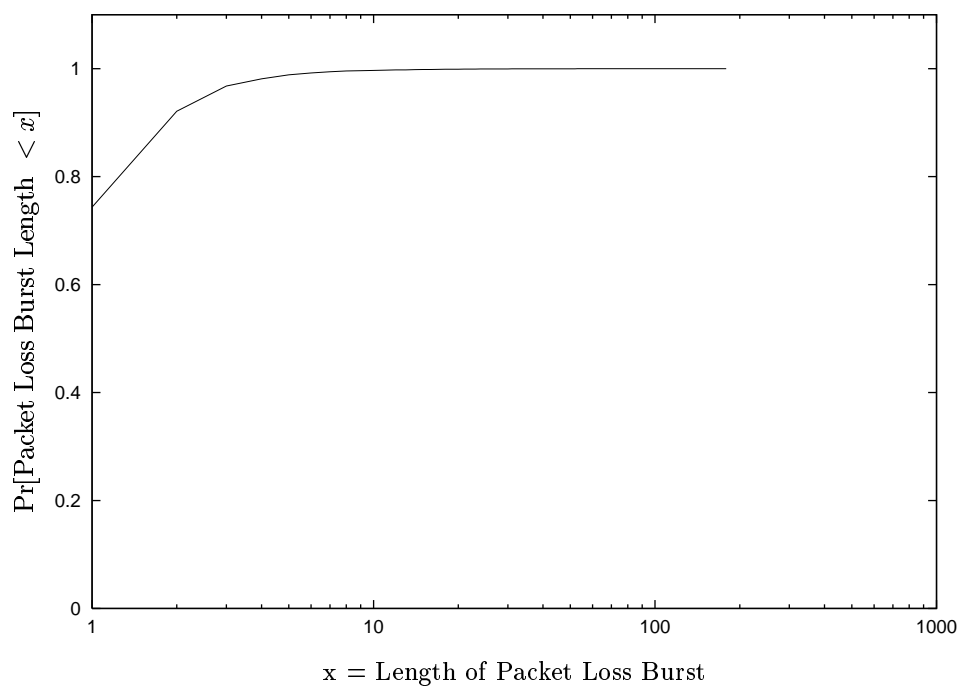


Figure 2.12: Cumulative Distribution Function of packet loss burst lengths for compound trace for **longterm2** measurement and  $k_0 = 1$

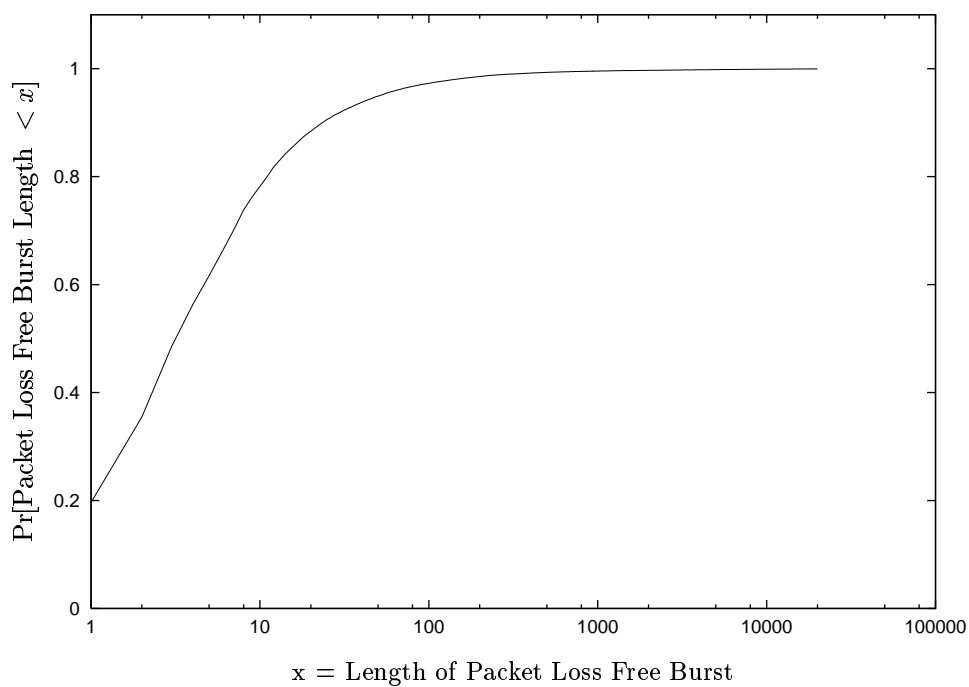


Figure 2.13: Cumulative distribution function of packet loss free burst lengths for compound trace for **longterm2** measurement and  $k_0 = 1$

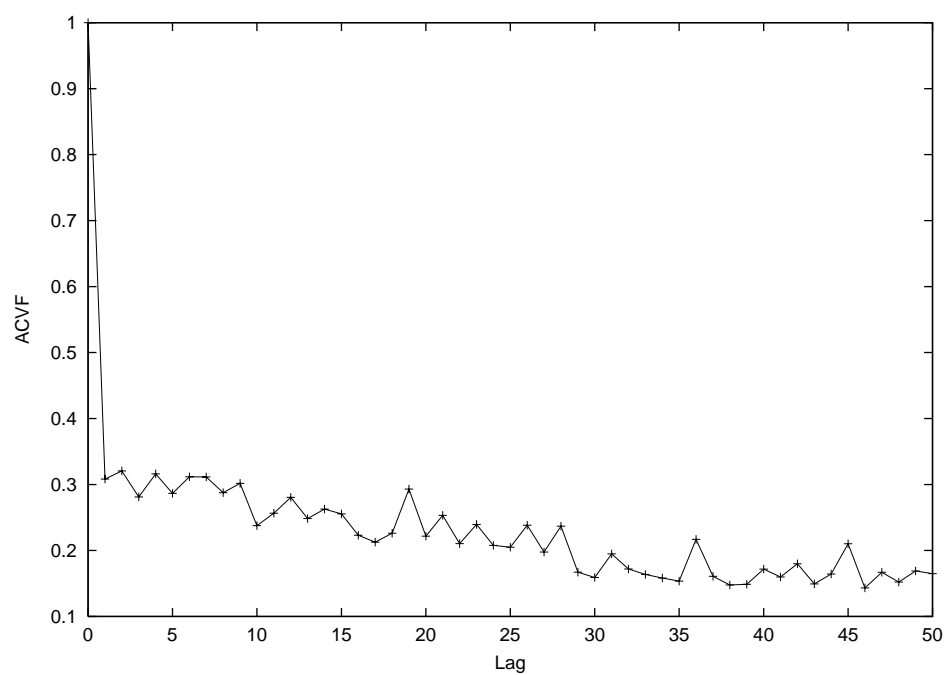


Figure 2.14: Autocovariance function of packet loss burst length sequence for the compound trace and  $k_0 = 1$  for **longterm2** measurement

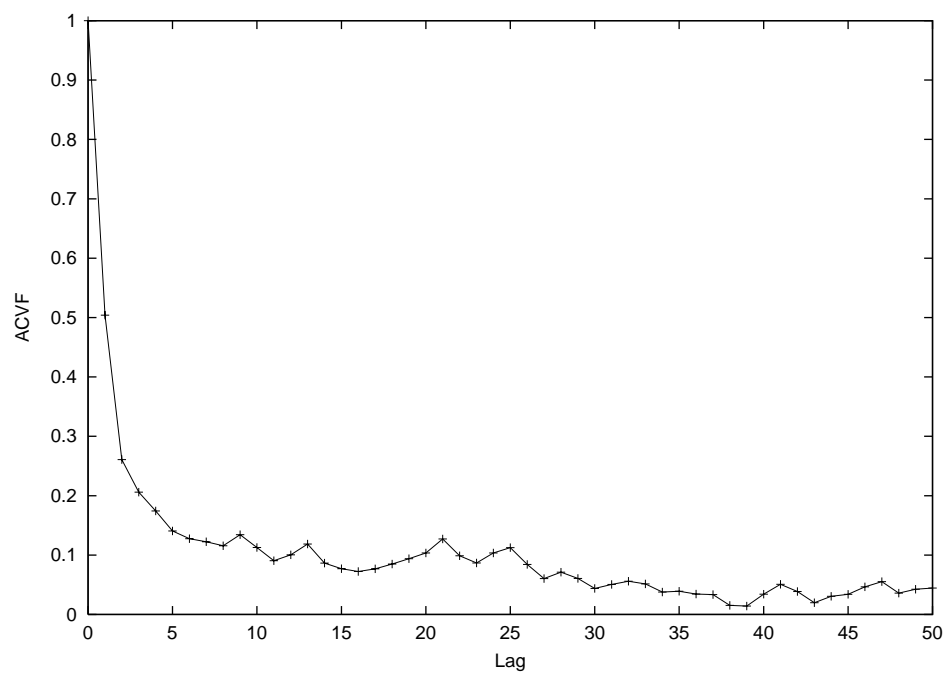
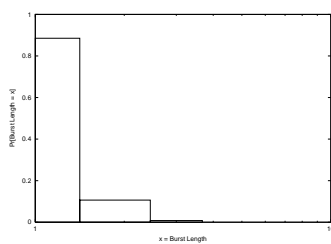


Figure 2.15: Autocovariance function of packet loss free burst length sequence for the compound trace and  $k_0 = 1$  for **longterm2** measurement

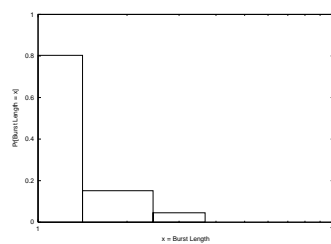




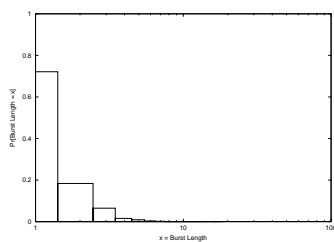
Trace 2, PLR = 0.00125



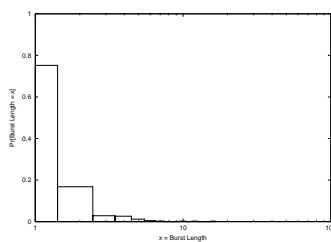
Trace 3, PLR = 0.0137



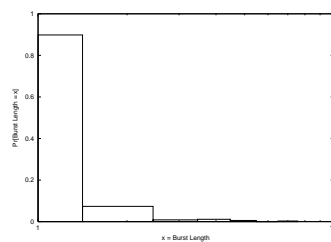
Trace 4, PLR = 0.0041



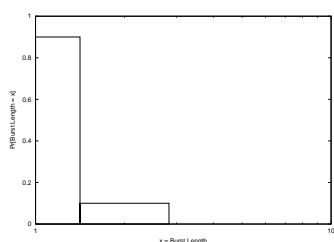
Trace 5, PLR = 0.13465



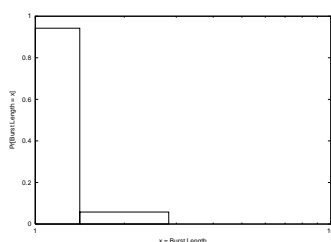
Trace 6, PLR = 0.0311



Trace 7, PLR = 0.0206



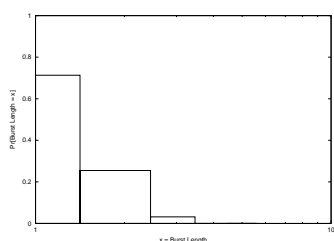
Trace 8, PLR = 0.0066



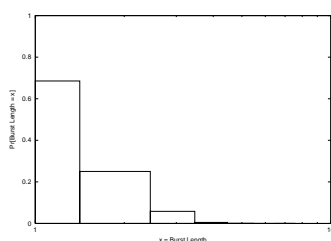
Trace 9, PLR = 0.0247



Trace 10, PLR = 0.06895



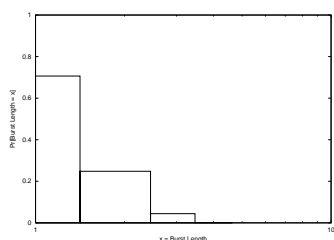
Trace 11, PLR = 0.16405



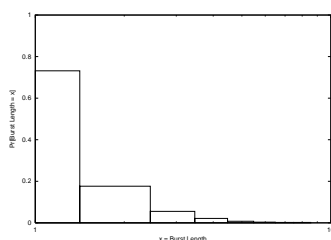
Trace 12, PLR = 0.2083



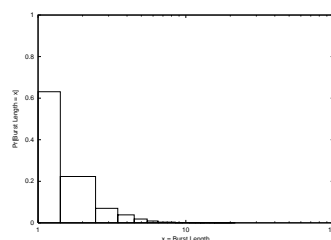
Trace 13, PLR = 0.22745



Trace 14, PLR = 0.20105

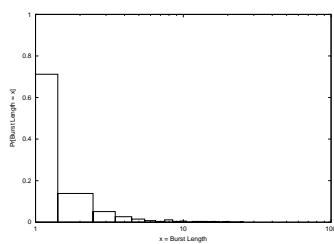


Trace 15, PLR = 0.1031

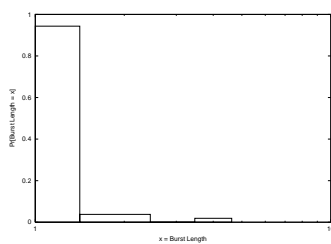


Trace 16, PLR = 0.2319

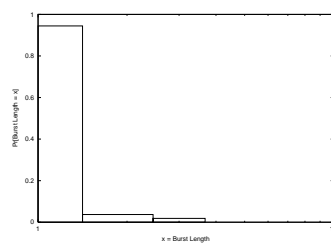
Table 2.9: Density of Packet Loss Burst Length (Burst Order  $k_0 = 1$ ), Traces 2 to 16 for **longterm2** measurement



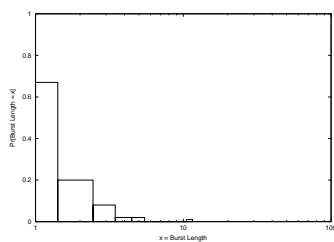
Trace 17, PLR = 0.05195



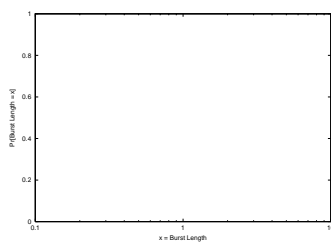
Trace 26, PLR = 0.0029



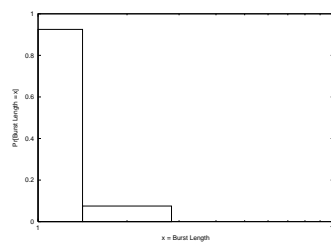
Trace 28, PLR = 0.0029



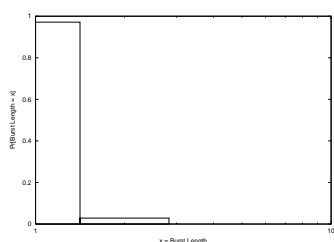
Trace 31, PLR = 0.008



Trace 32, PLR = 0.0012



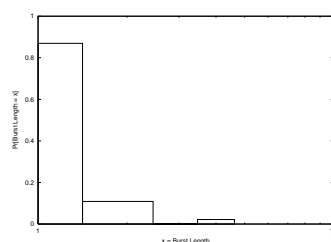
Trace 33, PLR = 0.00215



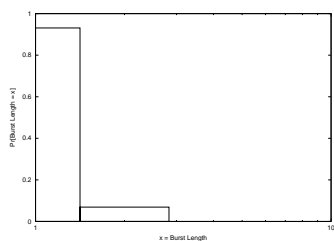
Trace 35, PLR = 0.0018



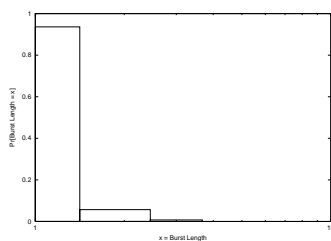
Trace 39, PLR = 0.03095



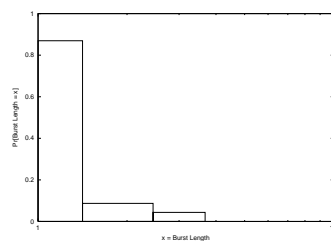
Trace 40, PLR = 0.0027



Trace 41, PLR = 0.00155



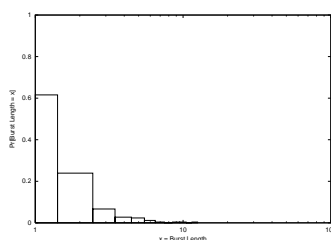
Trace 42, PLR = 0.00755



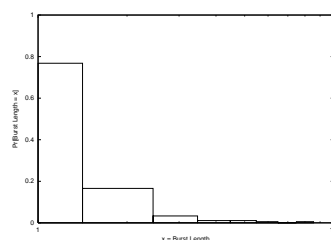
Trace 49, PLR = 0.00135



Trace 52, PLR = 0.00135

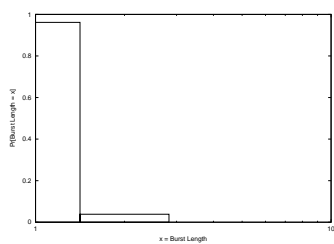


Trace 54, PLR = 0.0222

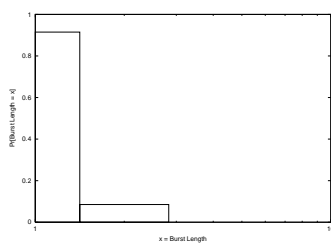


Trace 55, PLR = 0.01245

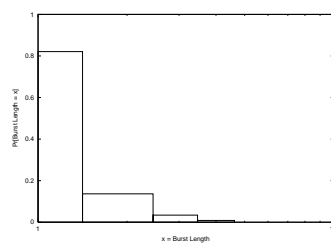
Table 2.10: Density of Packet Loss Burst Length (Burst Order  $k_0 = 1$ ), Traces 17 to 55 for **longterm2** measurement



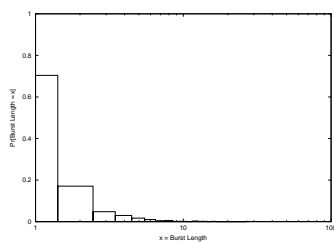
Trace 56, PLR = 0.00135



Trace 61, PLR = 0.00255



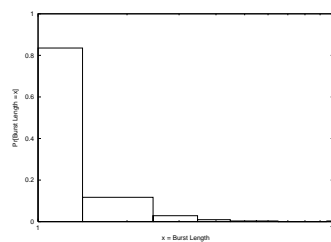
Trace 62, PLR = 0.02885



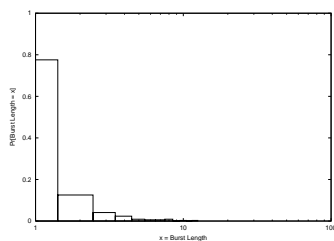
Trace 63, PLR = 0.05975



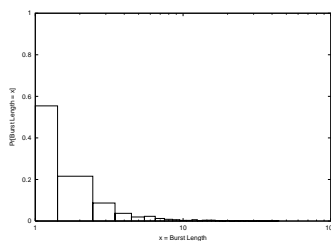
Trace 64, PLR = 0.01425



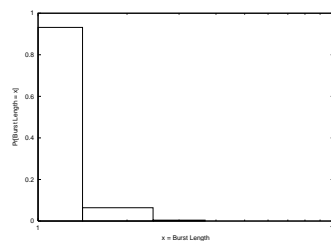
Trace 65, PLR = 0.0199



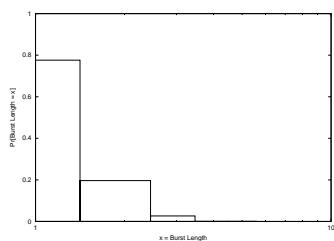
Trace 66, PLR = 0.02565



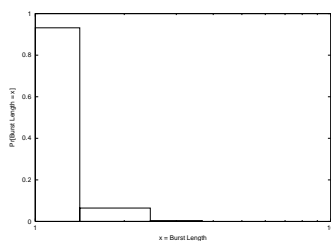
Trace 67, PLR = 0.1182



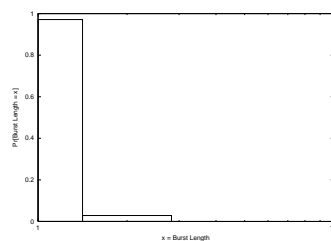
Trace 68, PLR = 0.02515



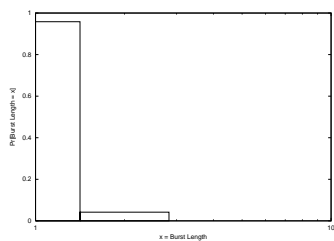
Trace 69, PLR = 0.1278



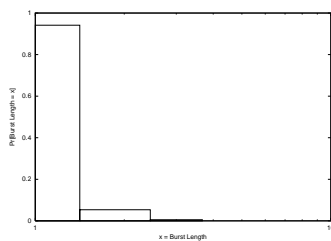
Trace 70, PLR = 0.01415



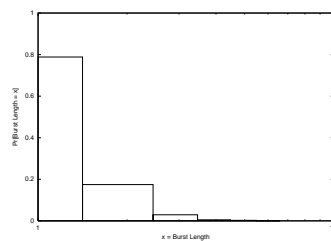
Trace 71, PLR = 0.0216



Trace 72, PLR = 0.00625



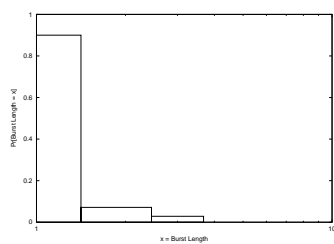
Trace 73, PLR = 0.0299



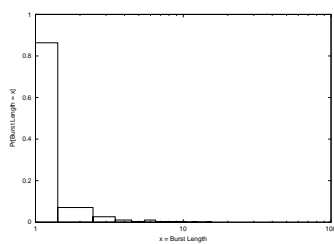
Trace 74, PLR = 0.1292

Table 2.11: Density of Packet Loss Burst Length (Burst Order  $k_0 = 1$ ), Traces 56 to 74 for **longterm2** measurement

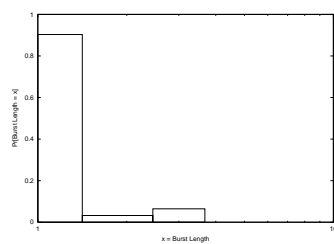




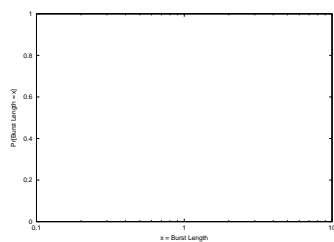
Trace 75, PLR = 0.00395



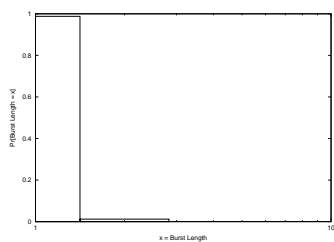
Trace 76, PLR = 0.02595



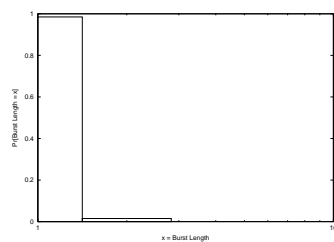
Trace 90, PLR = 0.0018



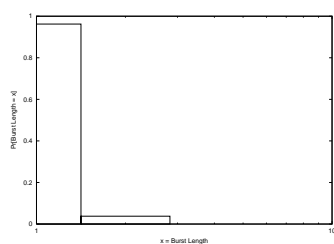
Trace 100, PLR = 0.00105



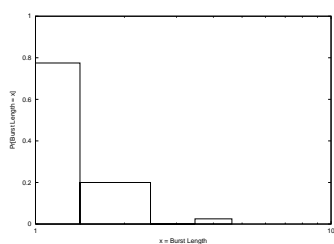
Trace 101, PLR = 0.0084



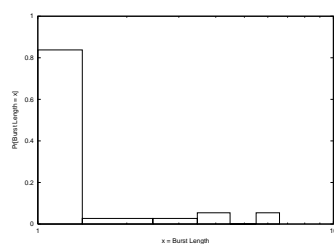
Trace 106, PLR = 0.01695



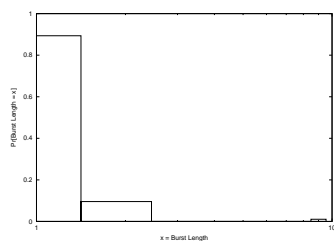
Trace 107, PLR = 0.00275



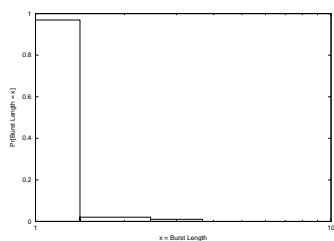
Trace 108, PLR = 0.00255



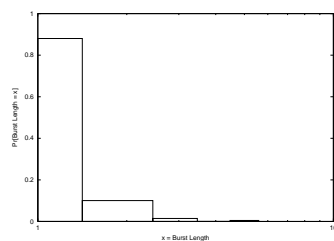
Trace 109, PLR = 0.0028



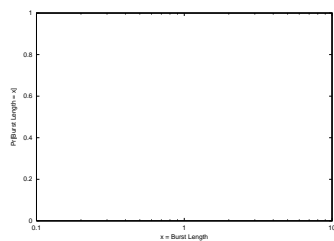
Trace 110, PLR = 0.00555



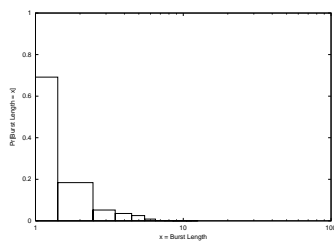
Trace 111, PLR = 0.0152



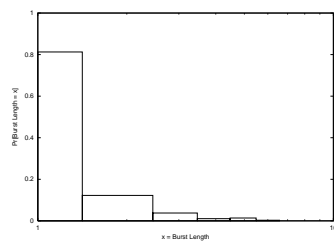
Trace 113, PLR = 0.012



Trace 117, PLR = 0.0015



Trace 118, PLR = 0.18445

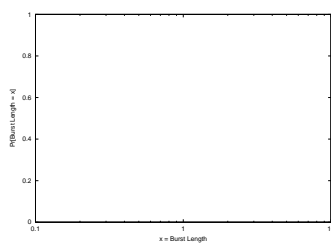


Trace 119, PLR = 0.043

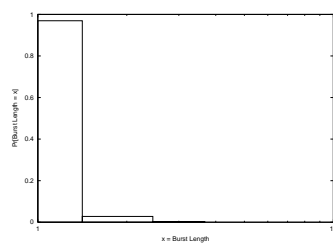
Table 2.12: Density of Packet Loss Burst Length (Burst Order  $k_0 = 1$ ), Traces 75 to 119 for **longterm2** measurement



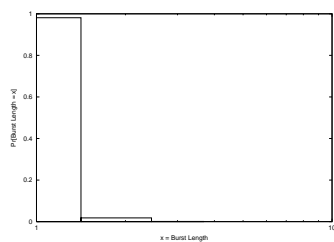
Trace 120, PLR = 0.01635



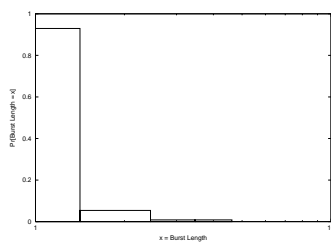
Trace 123, PLR = 0.00205



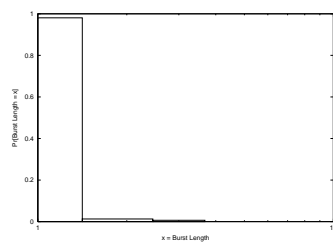
Trace 124, PLR = 0.0186



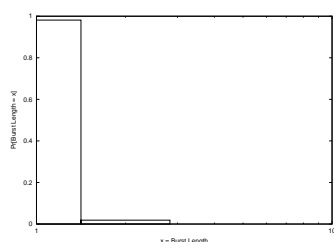
Trace 125, PLR = 0.0514



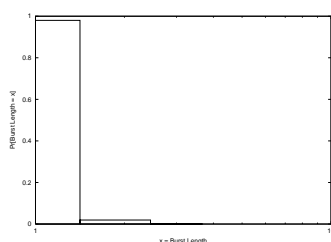
Trace 126, PLR = 0.0132



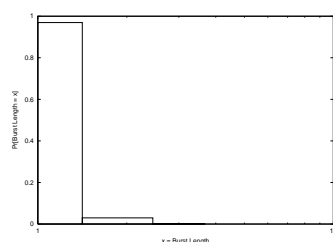
Trace 135, PLR = 0.0159



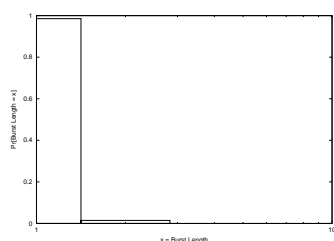
Trace 136, PLR = 0.0517



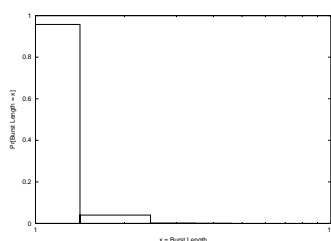
Trace 137, PLR = 0.09745



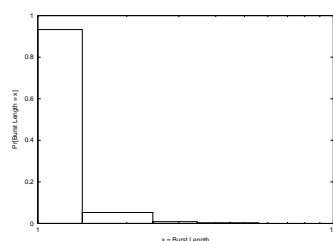
Trace 138, PLR = 0.05905



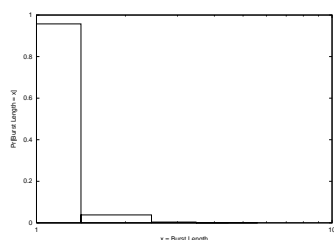
Trace 139, PLR = 0.06955



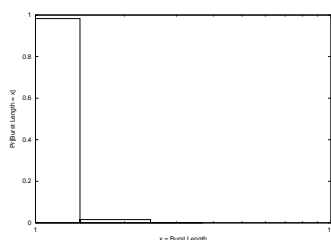
Trace 140, PLR = 0.07025



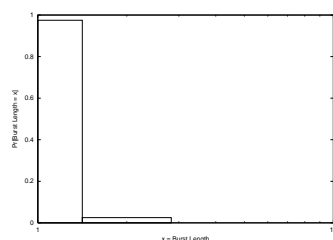
Trace 141, PLR = 0.0568



Trace 142, PLR = 0.08355

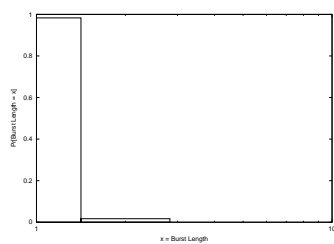


Trace 143, PLR = 0.0747

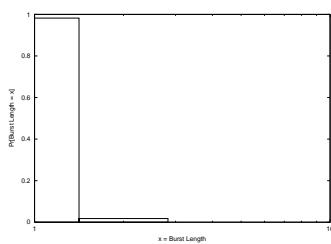


Trace 144, PLR = 0.07305

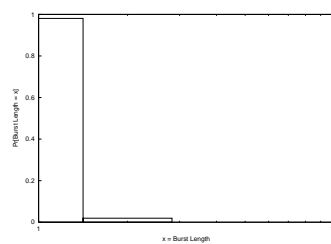
Table 2.13: Density of Packet Loss Burst Length (Burst Order  $k_0 = 1$ ), Traces 120 to 144 for **longterm2** measurement



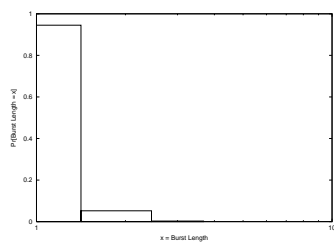
Trace 145, PLR = 0.027



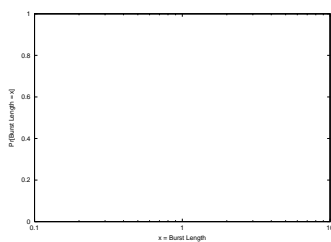
Trace 146, PLR = 0.0143



Trace 147, PLR = 0.00525



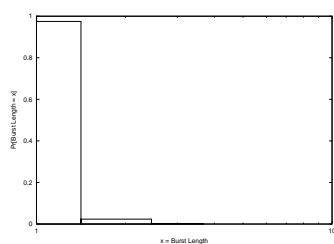
Trace 158, PLR = 0.0193



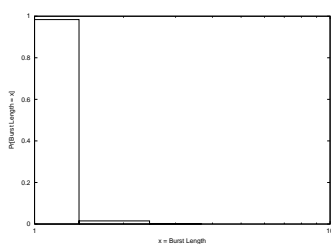
Trace 159, PLR = 0.0023



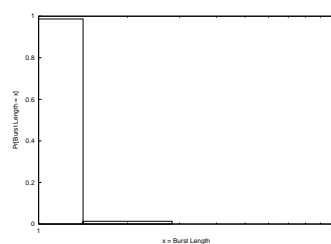
Trace 164, PLR = 0.00965



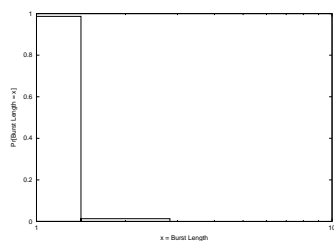
Trace 165, PLR = 0.0348



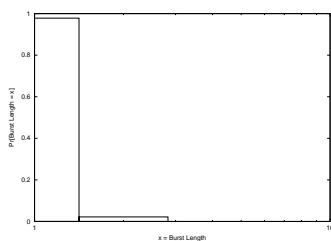
Trace 166, PLR = 0.0439



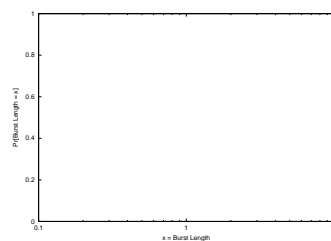
Trace 167, PLR = 0.0268



Trace 168, PLR = 0.01535



Trace 169, PLR = 0.0117

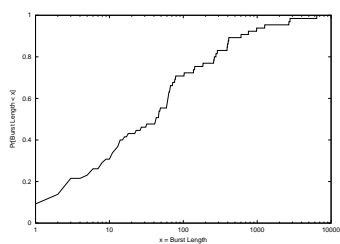


Trace 176, PLR = 0.0011

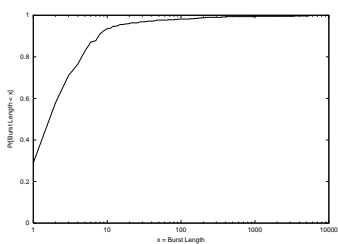
Trace 179, PLR = 0.02705

Table 2.14: Density of Packet Loss Burst Length (Burst Order  $k_0 = 1$ ), Traces 145 to 179 for **longterm2** measurement

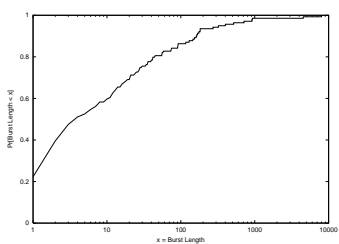




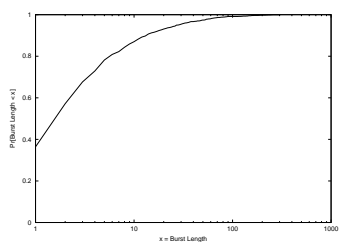
Trace 2, PLR = 0.00125



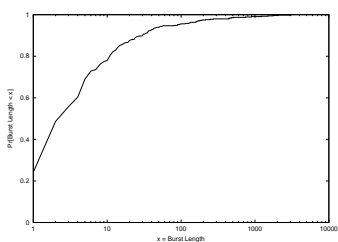
Trace 3, PLR = 0.0137



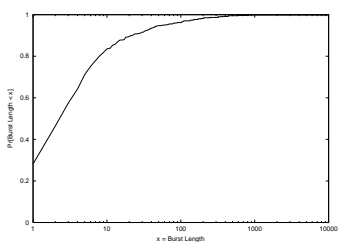
Trace 4, PLR = 0.0041



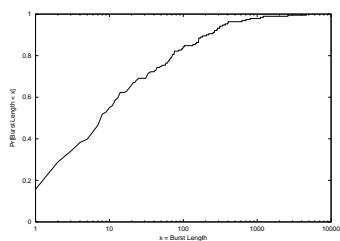
Trace 5, PLR = 0.13465



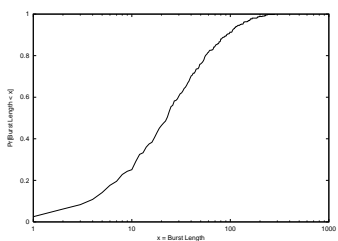
Trace 6, PLR = 0.0311



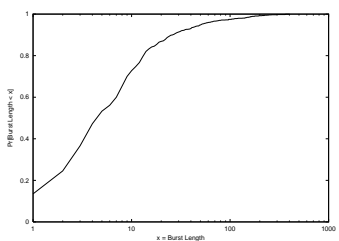
Trace 7, PLR = 0.0206



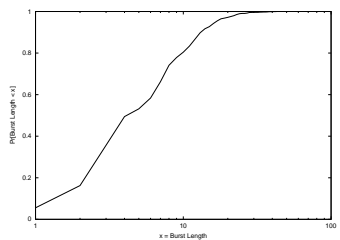
Trace 8, PLR = 0.0066



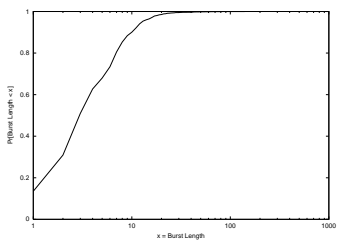
Trace 9, PLR = 0.0247



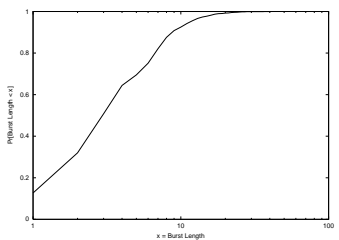
Trace 10, PLR = 0.06895



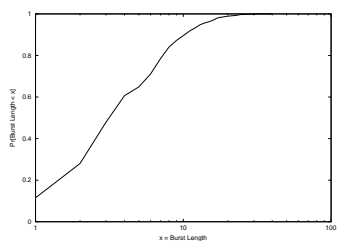
Trace 11, PLR = 0.16405



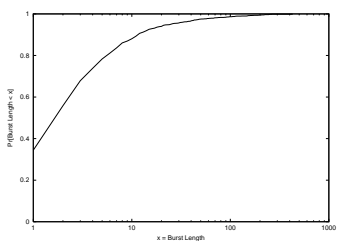
Trace 12, PLR = 0.2083



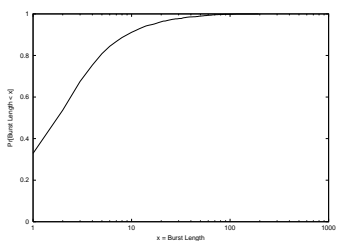
Trace 13, PLR = 0.22745



Trace 14, PLR = 0.20105

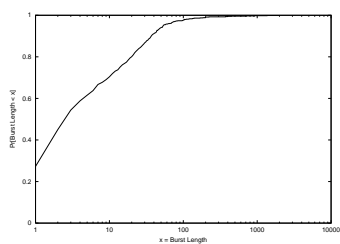


Trace 15, PLR = 0.1031

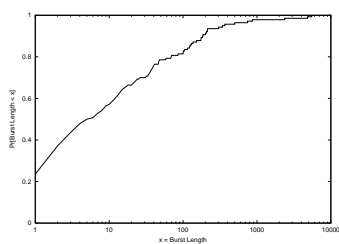


Trace 16, PLR = 0.2319

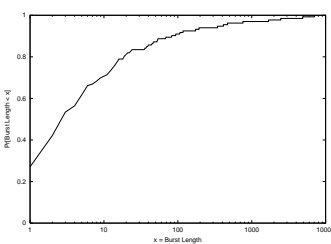
Table 2.15: Density of Packet Loss Free Burst Length ( $k_0 = 1$ ), Traces 2 to 16 for **longterm2** measurements



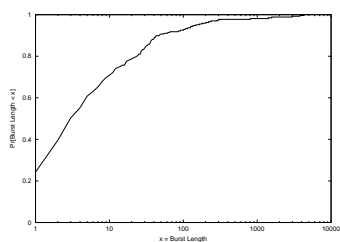
Trace 17, PLR = 0.05195



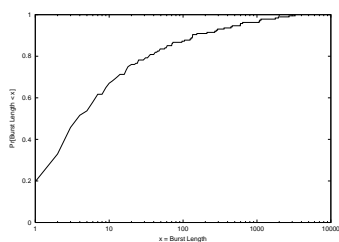
Trace 26, PLR = 0.0029



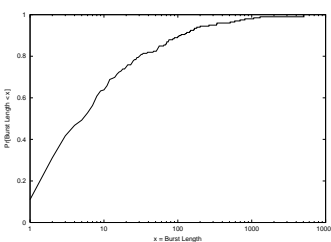
Trace 28, PLR = 0.0029



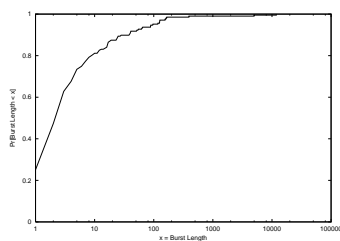
Trace 31, PLR = 0.008



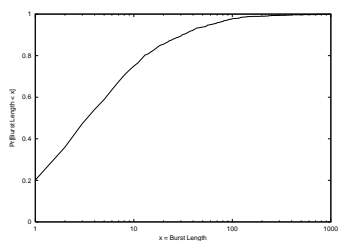
Trace 32, PLR = 0.0012



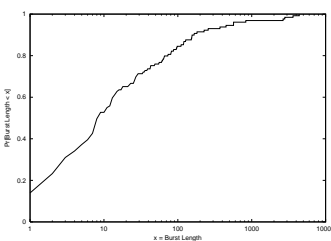
Trace 33, PLR = 0.00215



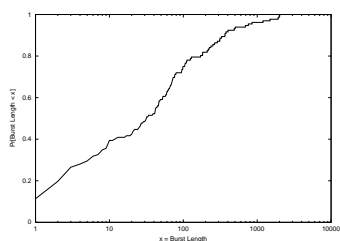
Trace 35, PLR = 0.0018



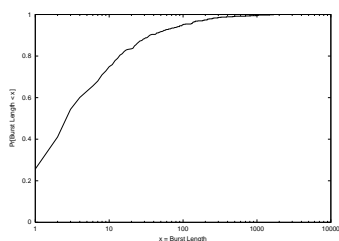
Trace 39, PLR = 0.03095



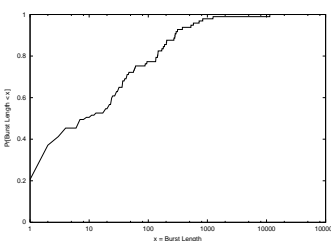
Trace 40, PLR = 0.0027



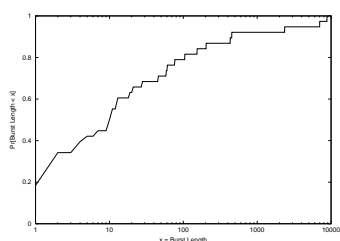
Trace 41, PLR = 0.00155



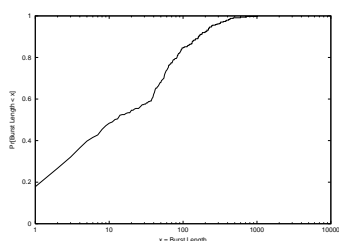
Trace 42, PLR = 0.00755



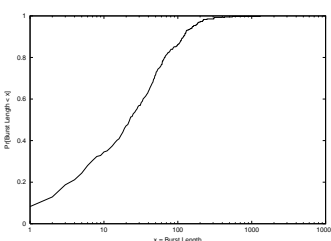
Trace 49, PLR = 0.00135



Trace 52, PLR = 0.00135

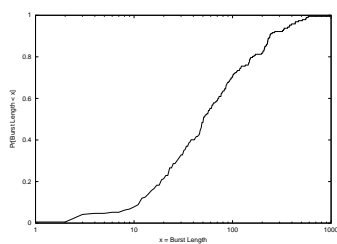


Trace 54, PLR = 0.0222

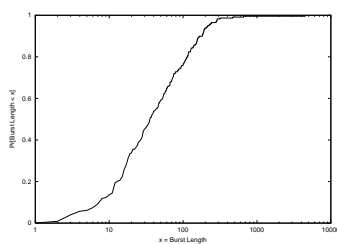


Trace 55, PLR = 0.01245

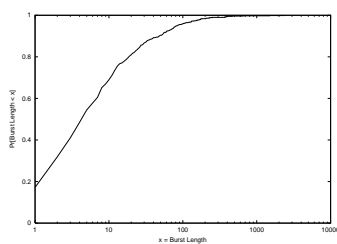
Table 2.16: Density of Packet Loss Free Burst Length ( $k_0 = 1$ ), Traces 17 to 55 for **longterm2** measurements



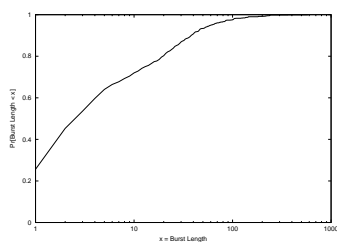
Trace 56, PLR = 0.00135



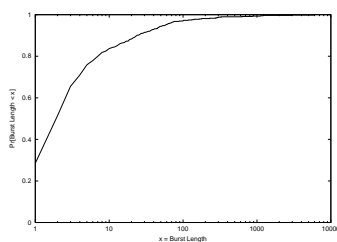
Trace 61, PLR = 0.00255



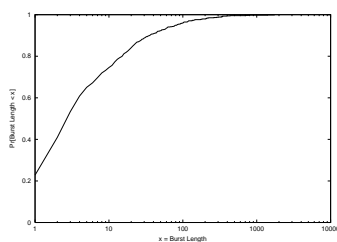
Trace 62, PLR = 0.02885



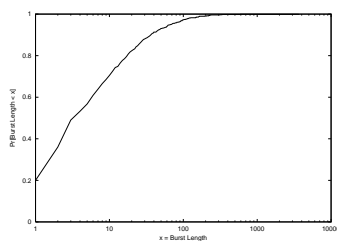
Trace 63, PLR = 0.05975



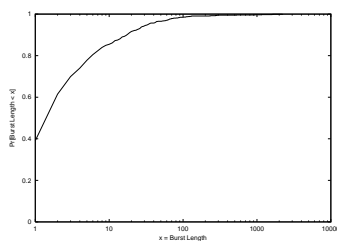
Trace 64, PLR = 0.01425



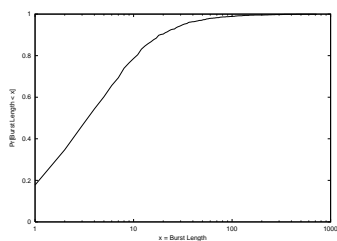
Trace 65, PLR = 0.0199



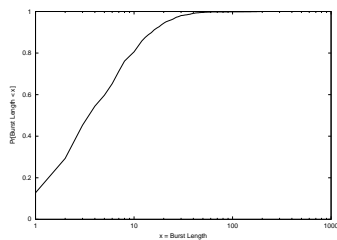
Trace 66, PLR = 0.02565



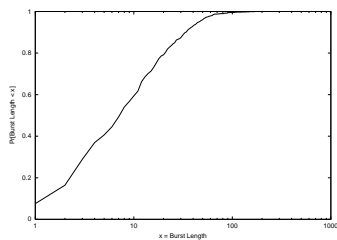
Trace 67, PLR = 0.1182



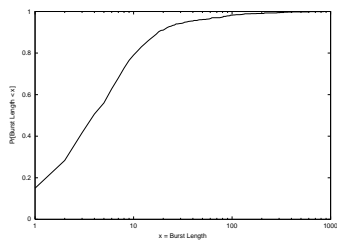
Trace 68, PLR = 0.02515



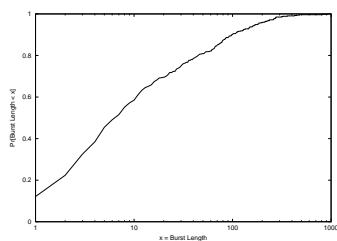
Trace 69, PLR = 0.1278



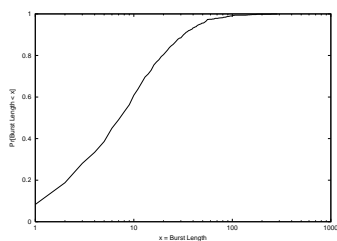
Trace 70, PLR = 0.01415



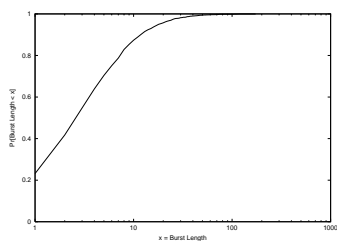
Trace 71, PLR = 0.0216



Trace 72, PLR = 0.00625

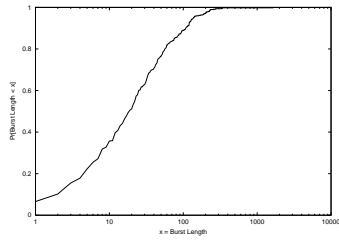


Trace 73, PLR = 0.0299

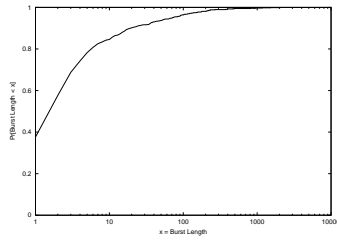


Trace 74, PLR = 0.1292

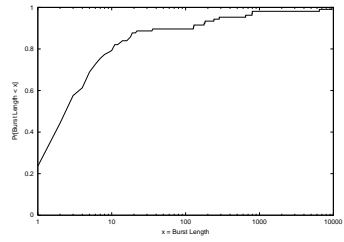
Table 2.17: Density of Packet Loss Free Burst Length ( $k_0 = 1$ ), Traces 56 to 74 for **longterm2** measurements



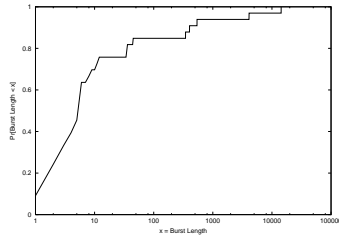
Trace 75, PLR = 0.00395



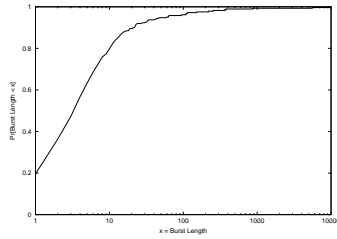
Trace 76, PLR = 0.02595



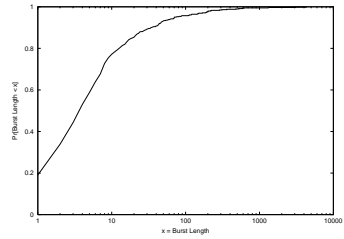
Trace 90, PLR = 0.0018



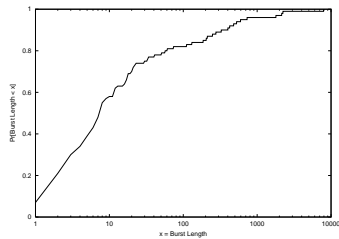
Trace 100, PLR = 0.00105



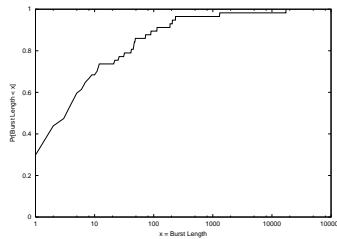
Trace 101, PLR = 0.0084



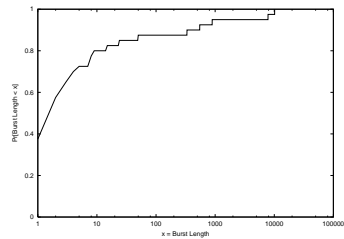
Trace 106, PLR = 0.01695



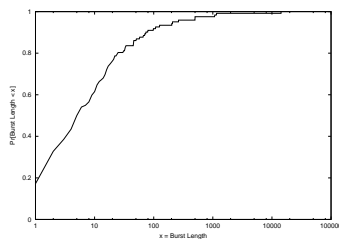
Trace 107, PLR = 0.00275



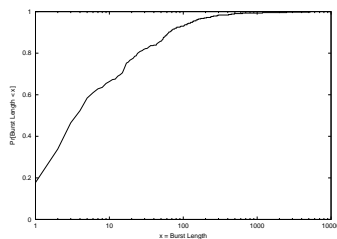
Trace 108, PLR = 0.00255



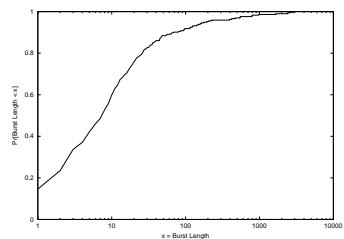
Trace 109, PLR = 0.0028



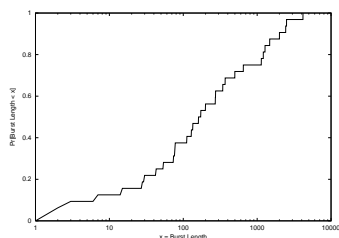
Trace 110, PLR = 0.00555



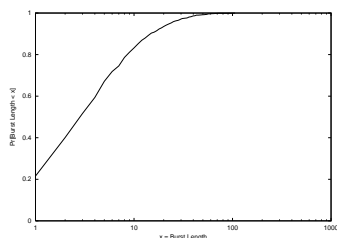
Trace 111, PLR = 0.0152



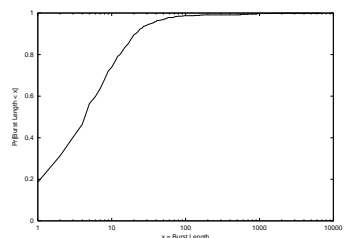
Trace 113, PLR = 0.012



Trace 117, PLR = 0.0015



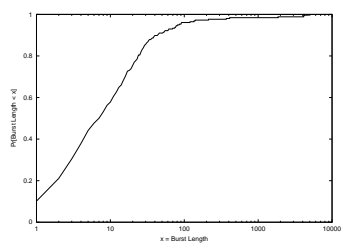
Trace 118, PLR = 0.18445



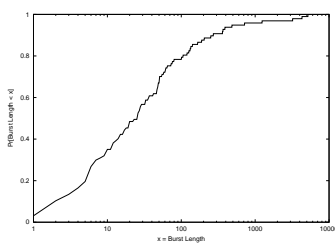
Trace 119, PLR = 0.043

Table 2.18: Density of Packet Loss Free Burst Length ( $k_0 = 1$ ), Traces 75 to 119 for **longterm2** measurements

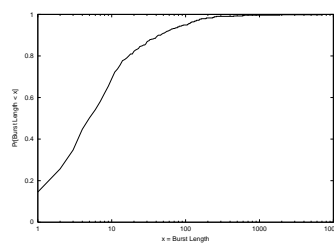




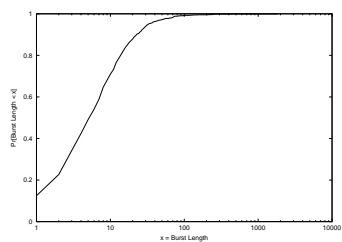
Trace 120, PLR = 0.01635



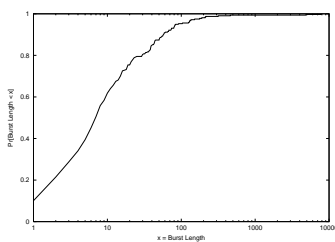
Trace 123, PLR = 0.00205



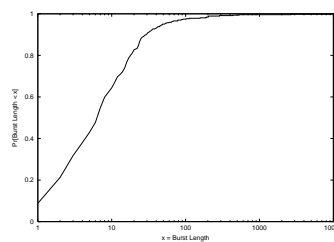
Trace 124, PLR = 0.0186



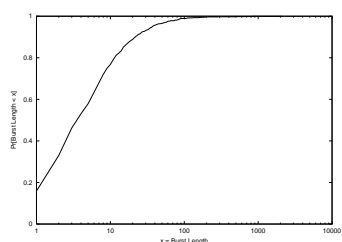
Trace 125, PLR = 0.0514



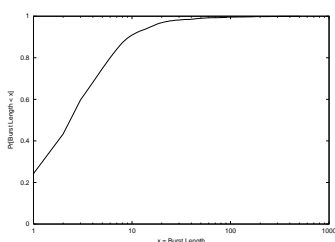
Trace 126, PLR = 0.0132



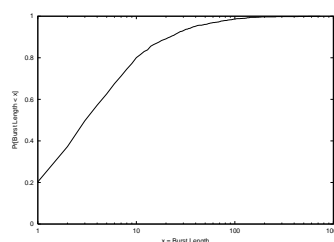
Trace 135, PLR = 0.0159



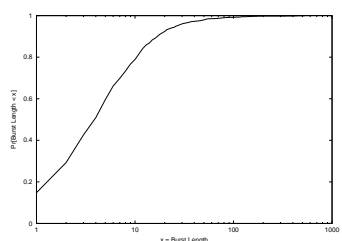
Trace 136, PLR = 0.0517



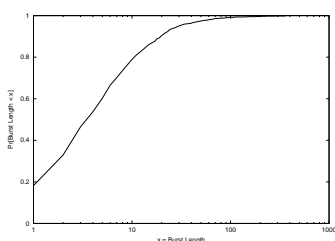
Trace 137, PLR = 0.09745



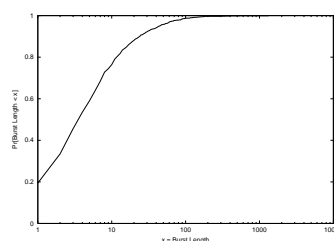
Trace 138, PLR = 0.05905



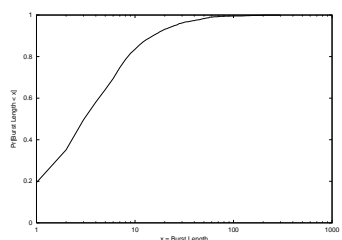
Trace 139, PLR = 0.06955



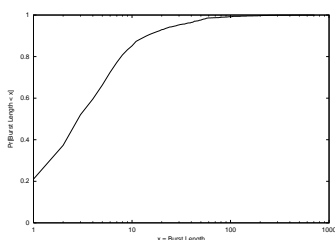
Trace 140, PLR = 0.07025



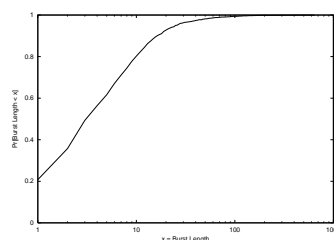
Trace 141, PLR = 0.0568



Trace 142, PLR = 0.08355

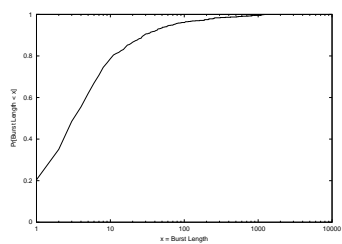


Trace 143, PLR = 0.0747

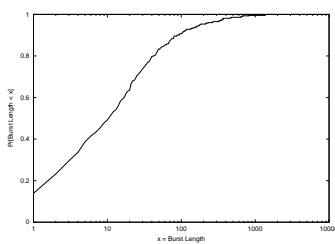


Trace 144, PLR = 0.07305

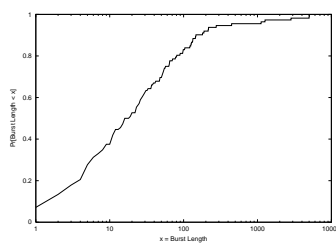
Table 2.19: Density of Packet Loss Free Burst Length ( $k_0 = 1$ ), Traces 120 to 144 for **longterm2** measurements



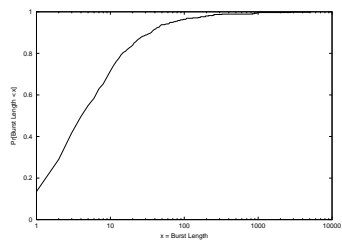
Trace 145, PLR = 0.027



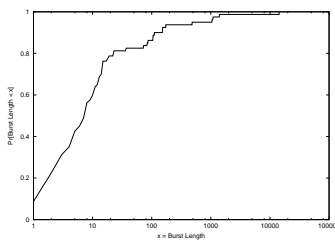
Trace 146, PLR = 0.0143



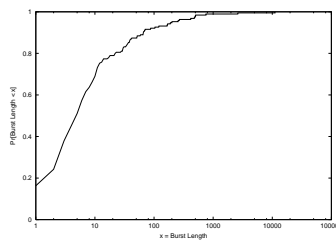
Trace 147, PLR = 0.00525



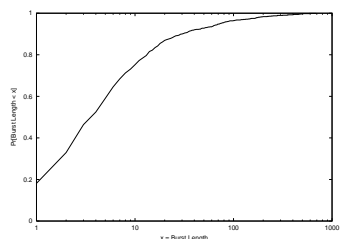
Trace 158, PLR = 0.0193



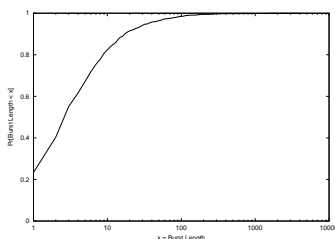
Trace 159, PLR = 0.0023



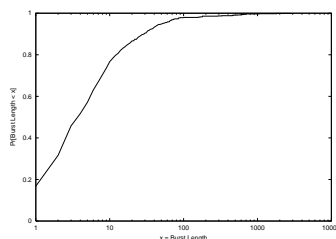
Trace 164, PLR = 0.00965



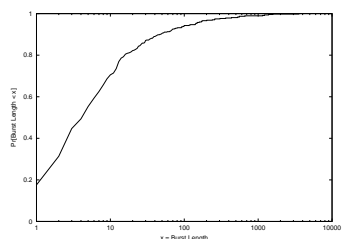
Trace 165, PLR = 0.0348



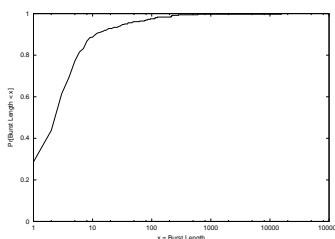
Trace 166, PLR = 0.0439



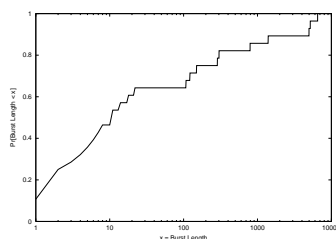
Trace 167, PLR = 0.0268



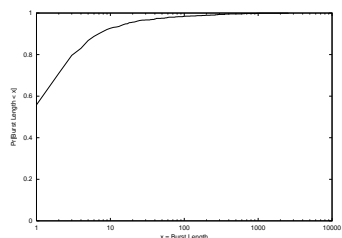
Trace 168, PLR = 0.01535



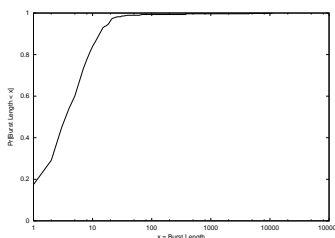
Trace 169, PLR = 0.0117



Trace 176, PLR = 0.0011



Trace 179, PLR = 0.02705

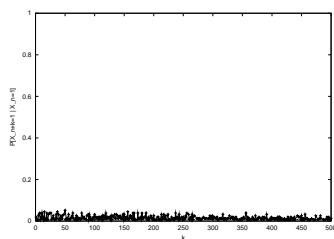


Trace 180, PLR = 0.02055

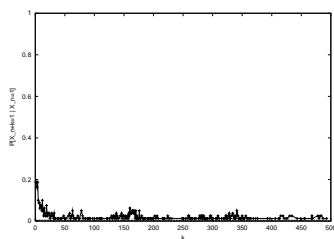
Table 2.20: Density of Packet Loss Free Burst Length ( $k_0 = 1$ ), Traces 145 to 180 for **longterm2** measurements

### 2.0.3 Second Order Statistics

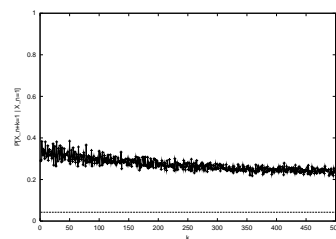




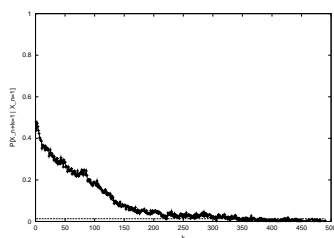
Trace 1, PLR = 0.00775



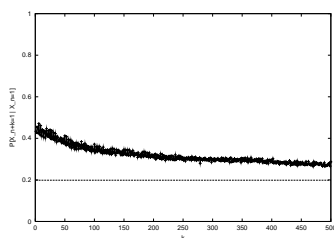
Trace 2, PLR = 0.004



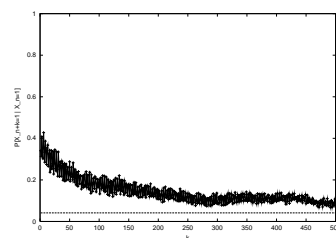
Trace 3, PLR = 0.0425



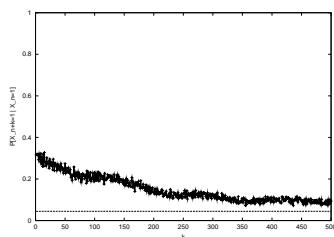
Trace 4, PLR = 0.01335



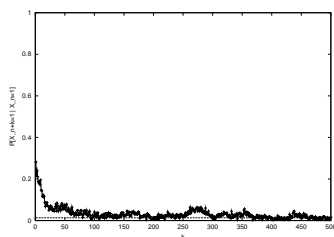
Trace 5, PLR = 0.19865



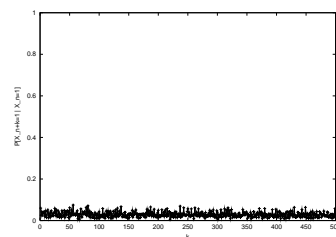
Trace 6, PLR = 0.0414



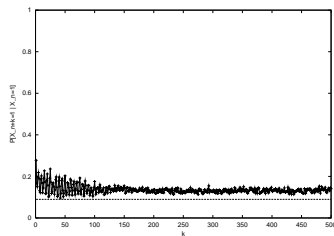
Trace 7, PLR = 0.0444



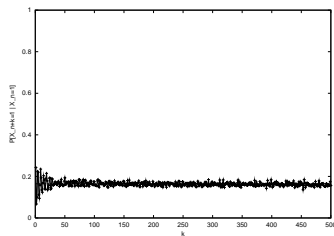
Trace 8, PLR = 0.0133



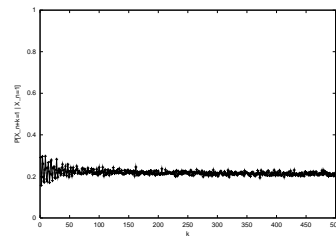
Trace 9, PLR = 0.0275



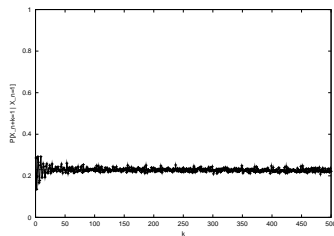
Trace 10, PLR = 0.08965



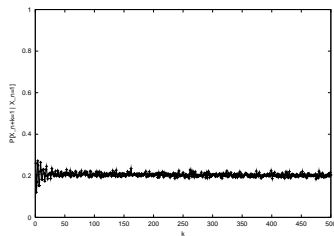
Trace 11, PLR = 0.16435



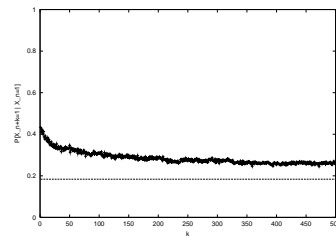
Trace 12, PLR = 0.2163



Trace 13, PLR = 0.2295

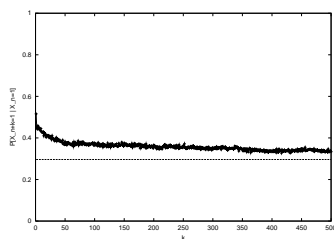


Trace 14, PLR = 0.2071

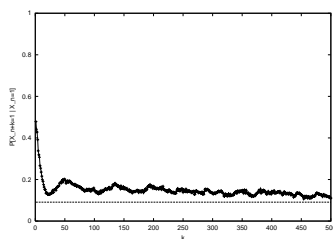


Trace 15, PLR = 0.1837

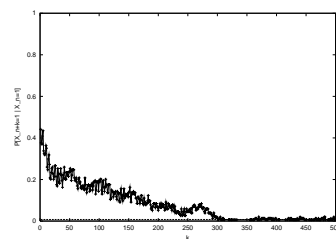
Table 2.21: Conditional Packet Loss Probabilities, Traces 1 to 15 for **longterm2** measurements



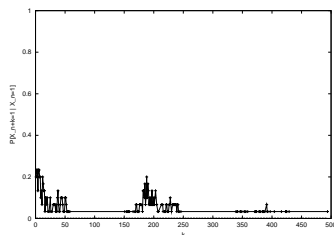
Trace 16, PLR = 0.2962



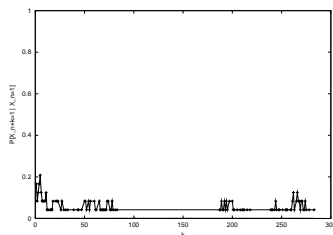
Trace 17, PLR = 0.091



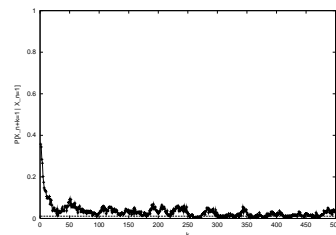
Trace 19, PLR = 0.0077



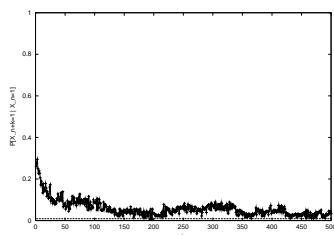
Trace 22, PLR = 0.0015



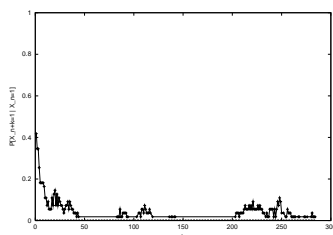
Trace 24, PLR = 0.0012



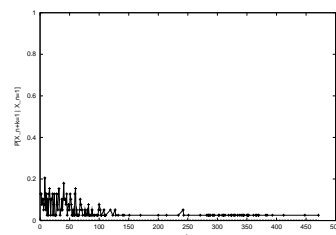
Trace 26, PLR = 0.0109



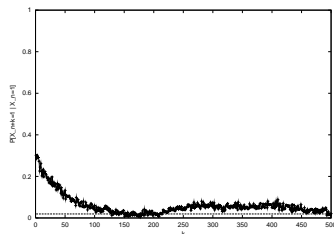
Trace 28, PLR = 0.009



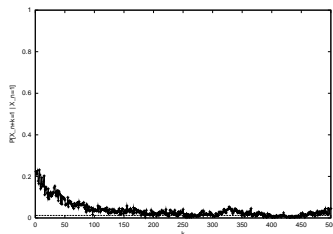
Trace 29, PLR = 0.00275



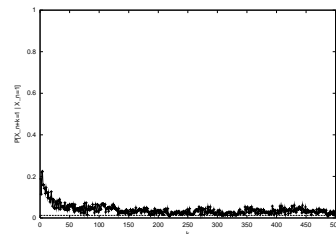
Trace 30, PLR = 0.00195



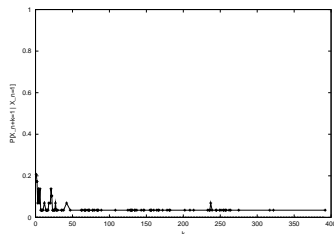
Trace 31, PLR = 0.01925



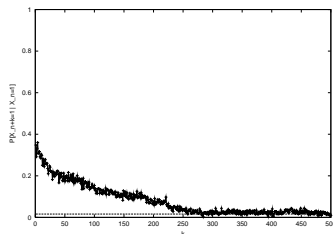
Trace 32, PLR = 0.0121



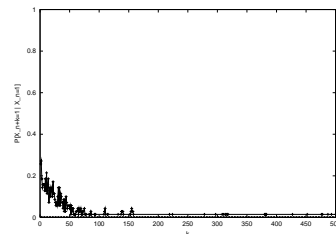
Trace 33, PLR = 0.01225



Trace 34, PLR = 0.00145

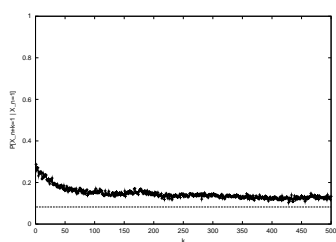


Trace 35, PLR = 0.01595

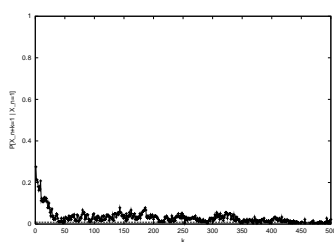


Trace 38, PLR = 0.0035

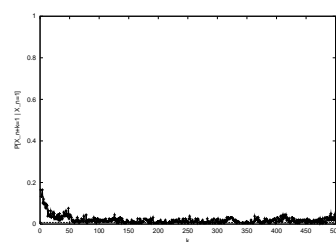
Table 2.22: Conditional Packet Loss Probabilities, Traces 16 to 38 for **longterm2** measurements



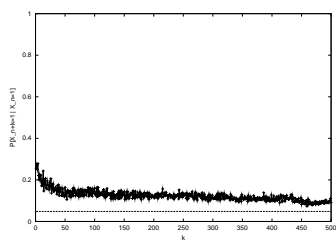
Trace 39, PLR = 0.08215



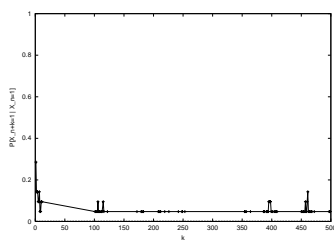
Trace 40, PLR = 0.0089



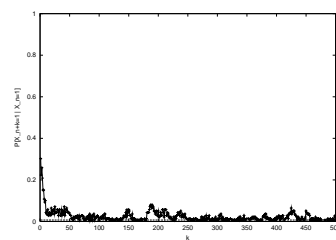
Trace 41, PLR = 0.0079



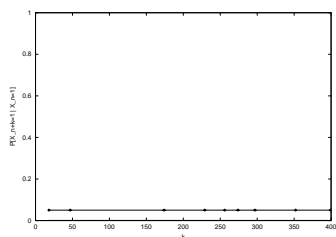
Trace 42, PLR = 0.0484



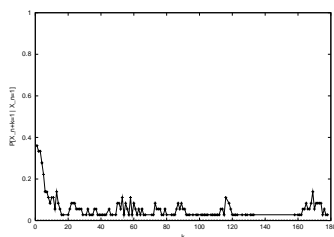
Trace 48, PLR = 0.00105



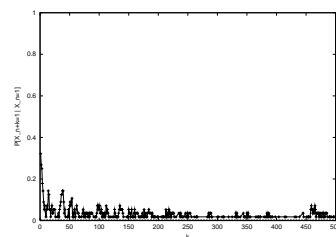
Trace 49, PLR = 0.00695



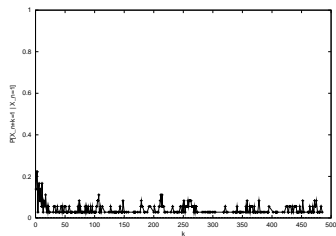
Trace 50, PLR = 0.001



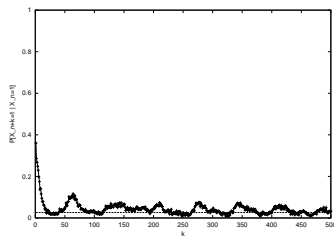
Trace 51, PLR = 0.0018



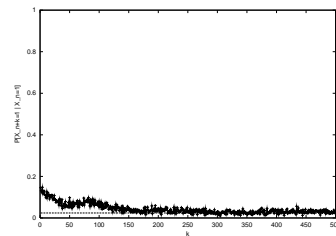
Trace 52, PLR = 0.0028



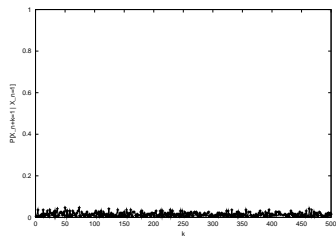
Trace 53, PLR = 0.0018



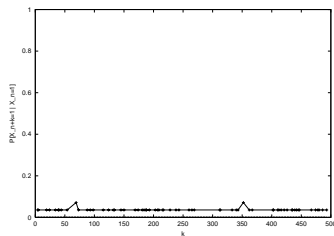
Trace 54, PLR = 0.02635



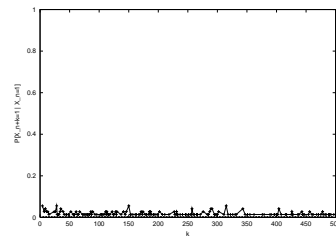
Trace 55, PLR = 0.02405



Trace 56, PLR = 0.00965

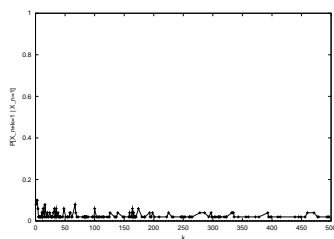


Trace 58, PLR = 0.0014

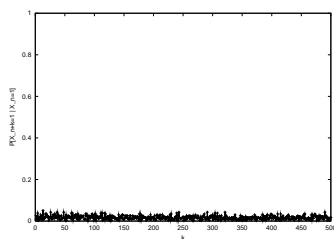


Trace 59, PLR = 0.0036

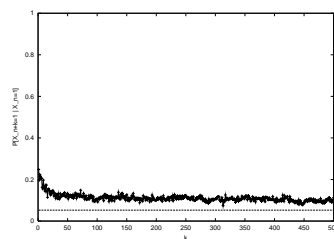
Table 2.23: Conditional Packet Loss Probabilities, Traces 39 to 59 for **longterm2** measurements



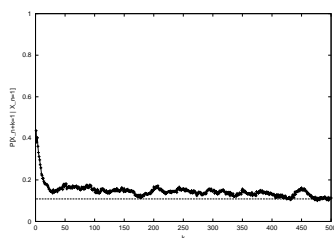
Trace 60, PLR = 0.0025



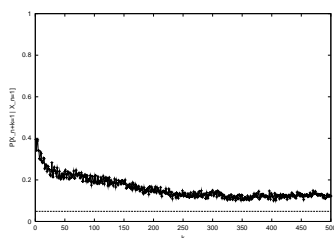
Trace 61, PLR = 0.0117



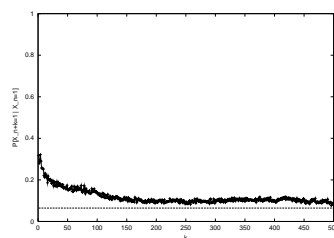
Trace 62, PLR = 0.05255



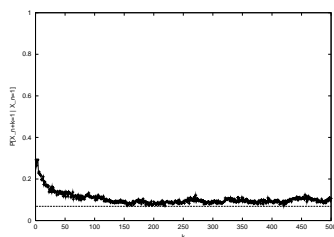
Trace 63, PLR = 0.10845



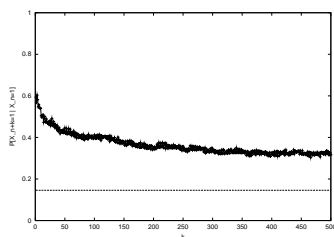
Trace 64, PLR = 0.04865



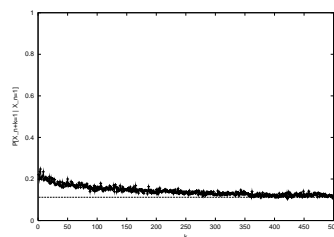
Trace 65, PLR = 0.0645



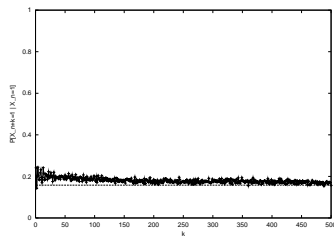
Trace 66, PLR = 0.0685



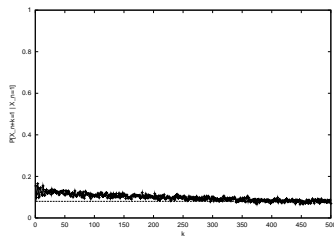
Trace 67, PLR = 0.1458



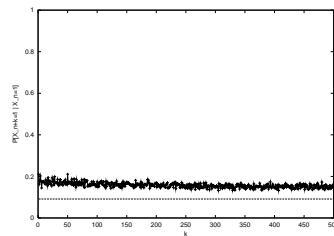
Trace 68, PLR = 0.11205



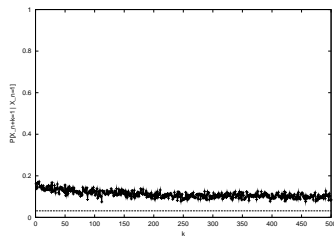
Trace 69, PLR = 0.1579



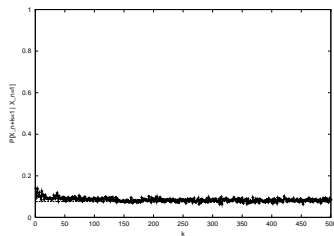
Trace 70, PLR = 0.08



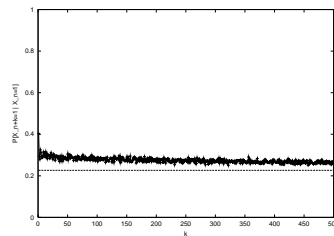
Trace 71, PLR = 0.09125



Trace 72, PLR = 0.0315



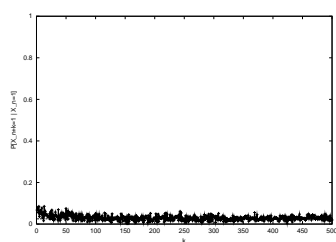
Trace 73, PLR = 0.07625



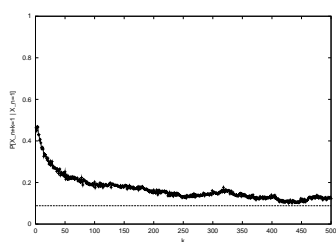
Trace 74, PLR = 0.2264

Table 2.24: Conditional Packet Loss Probabilities, Traces 60 to 74 for **longterm2** measurements

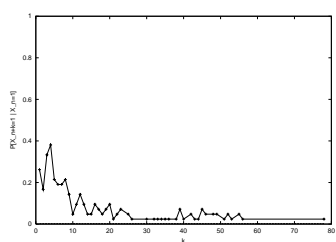




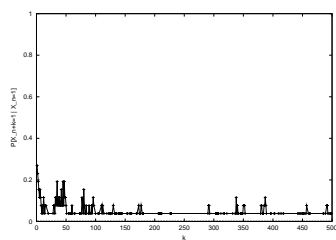
Trace 75, PLR = 0.02525



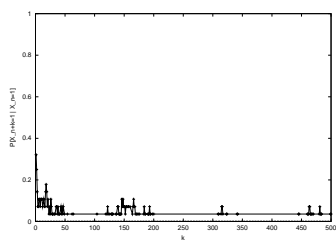
Trace 76, PLR = 0.0882



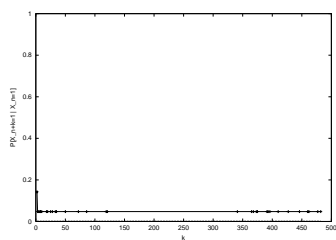
Trace 77, PLR = 0.0021



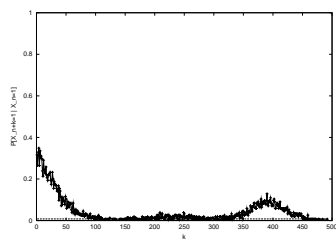
Trace 78, PLR = 0.0013



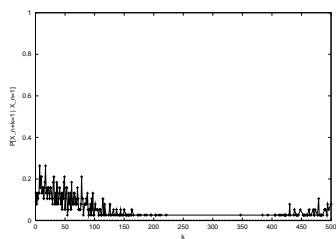
Trace 80, PLR = 0.0014



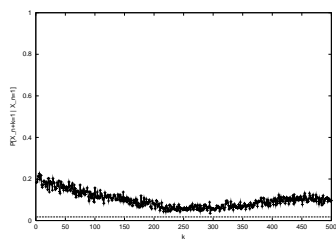
Trace 83, PLR = 0.00105



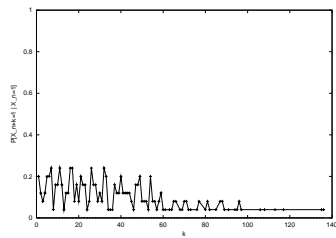
Trace 90, PLR = 0.00775



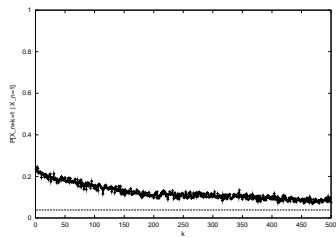
Trace 100, PLR = 0.0019



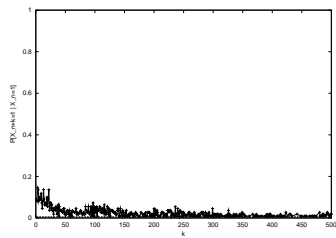
Trace 101, PLR = 0.0175



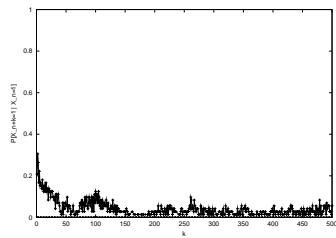
Trace 105, PLR = 0.00125



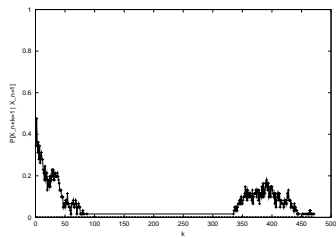
Trace 106, PLR = 0.0383



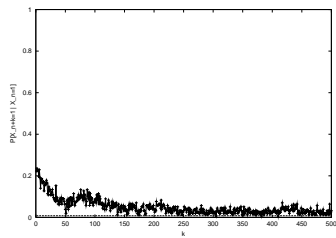
Trace 107, PLR = 0.0055



Trace 108, PLR = 0.0036

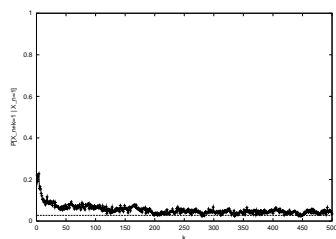


Trace 109, PLR = 0.00305

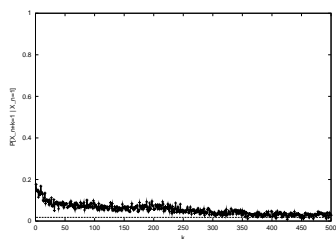


Trace 110, PLR = 0.00785

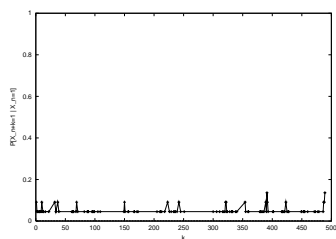
Table 2.25: Conditional Packet Loss Probabilities, Traces 75 to 110 for **longterm2** measurements



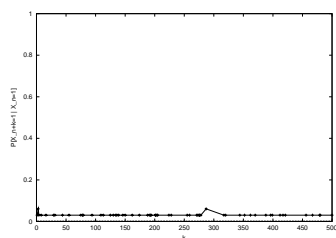
Trace 111, PLR = 0.0275



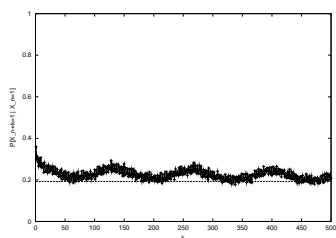
Trace 113, PLR = 0.01785



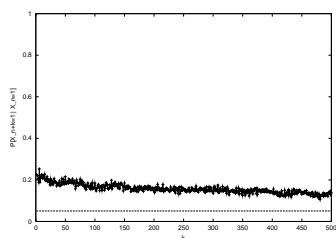
Trace 115, PLR = 0.0011



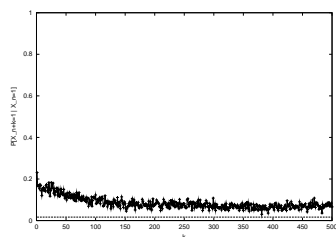
Trace 117, PLR = 0.00165



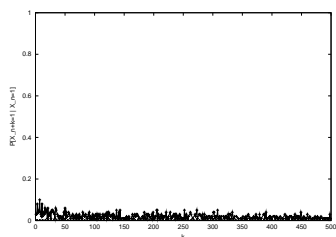
Trace 118, PLR = 0.1924



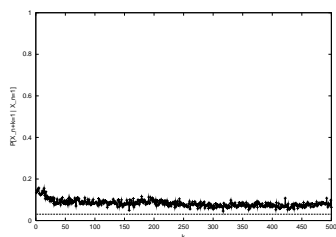
Trace 119, PLR = 0.0506



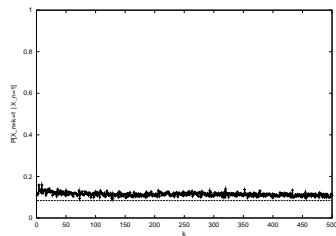
Trace 120, PLR = 0.01665



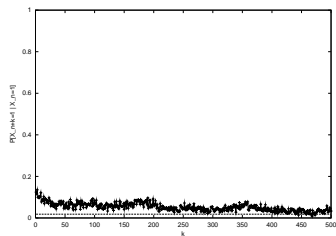
Trace 123, PLR = 0.005



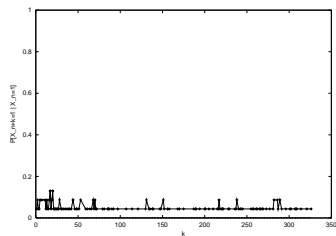
Trace 124, PLR = 0.0306



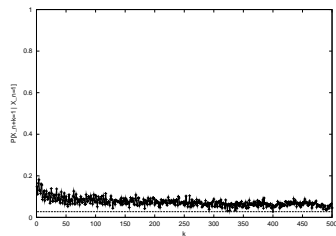
Trace 125, PLR = 0.0837



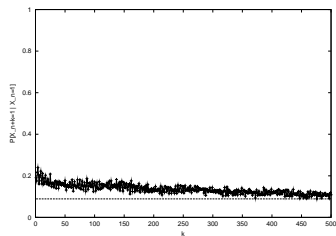
Trace 126, PLR = 0.0181



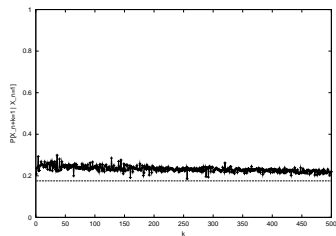
Trace 128, PLR = 0.00115



Trace 135, PLR = 0.02735

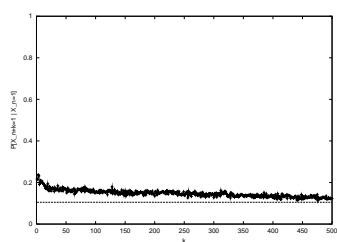


Trace 136, PLR = 0.089

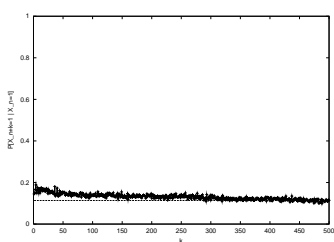


Trace 137, PLR = 0.17565

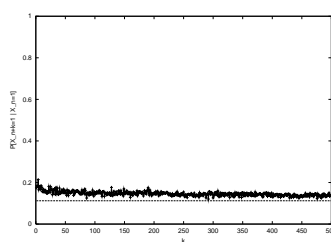
Table 2.26: Conditional Packet Loss Probabilities, Traces 111 to 137 for **longterm2** measurements



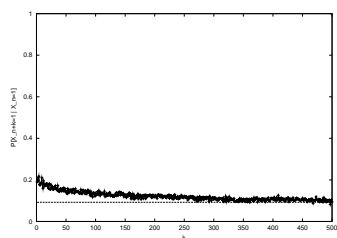
Trace 138, PLR = 0.10485



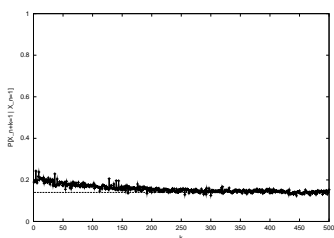
Trace 139, PLR = 0.1134



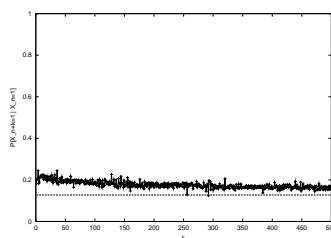
Trace 140, PLR = 0.1121



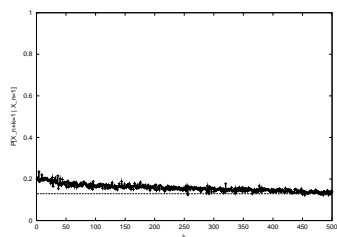
Trace 141, PLR = 0.09235



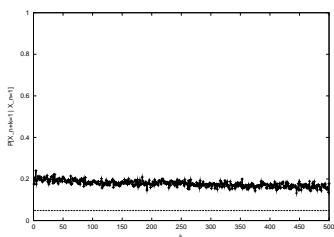
Trace 142, PLR = 0.13965



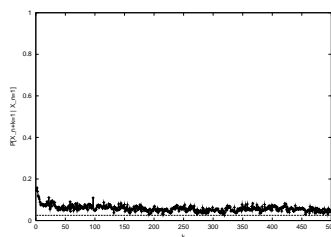
Trace 143, PLR = 0.12735



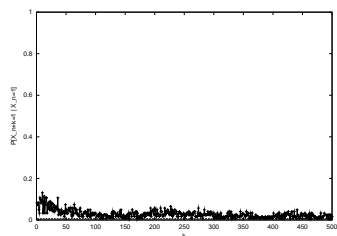
Trace 144, PLR = 0.12925



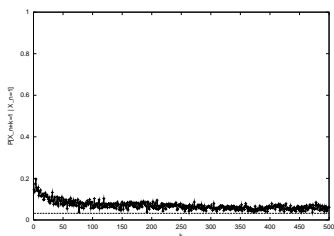
Trace 145, PLR = 0.0481



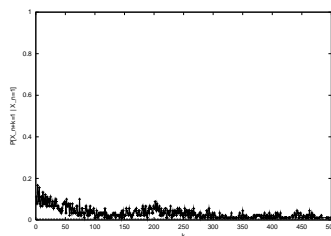
Trace 146, PLR = 0.0252



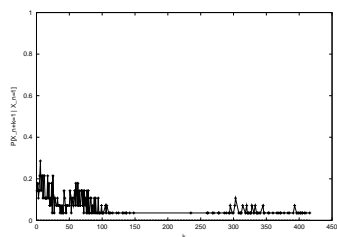
Trace 147, PLR = 0.0061



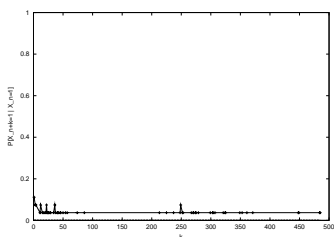
Trace 158, PLR = 0.032



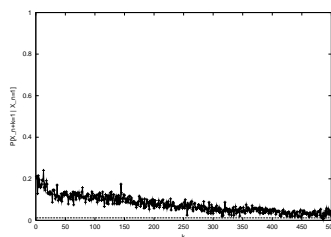
Trace 159, PLR = 0.0045



Trace 160, PLR = 0.0014

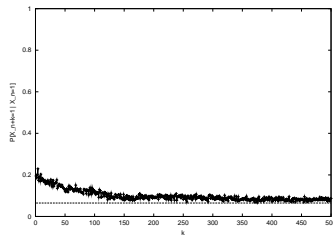


Trace 163, PLR = 0.00135

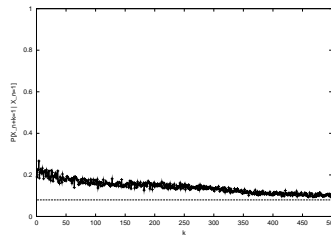


Trace 164, PLR = 0.01205

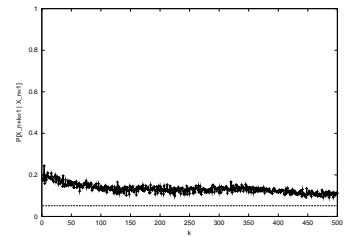
Table 2.27: Conditional Packet Loss Probabilities, Traces 138 to 164 for **longterm2** measurements



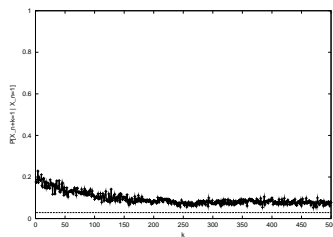
Trace 165, PLR = 0.06465



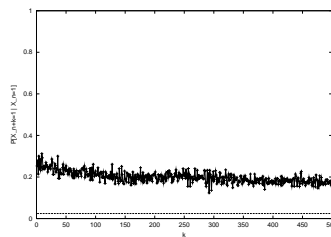
Trace 166, PLR = 0.07985



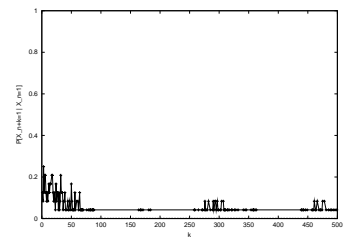
Trace 167, PLR = 0.05175



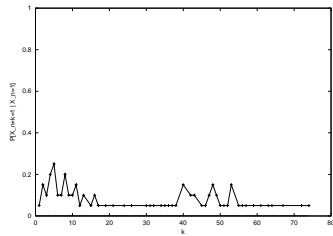
Trace 168, PLR = 0.02865



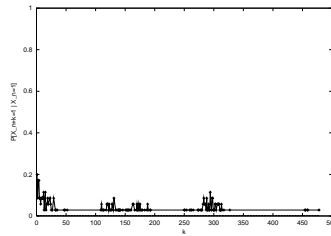
Trace 169, PLR = 0.0243



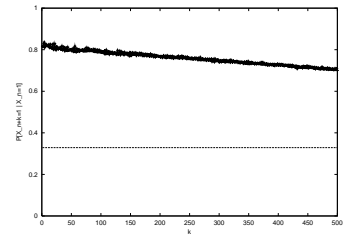
Trace 173, PLR = 0.0012



Trace 175, PLR = 0.001



Trace 176, PLR = 0.00175



Trace 179, PLR = 0.3288

Table 2.28: Conditional Packet Loss Probabilities, Traces 165 to 179 for **longterm2** measurements

## Bibliography

- [1] Andreas Willig, Martin Kubisch, and Adam Wolisz. Bit Error Rate Measurements – Second Campaign, factorial measurement. TKN Technical Report Series TKN-00-011, Telecommunication Networks Group, Technical University Berlin, November 2000. <http://www-tnk.ee.tu-berlin.de/publications/tnkrreports.html>.
- [2] Andreas Willig, Martin Kubisch, and Adam Wolisz. Bit Error Rate Measurements – Second Campaign, longterm1 measurement. TKN Technical Report Series TKN-00-009, Telecommunication Networks Group, Technical University Berlin, November 2000. <http://www-tnk.ee.tu-berlin.de/publications/tnkrreports.html>.
- [3] Andreas Willig, Martin Kubisch, and Adam Wolisz. Measurements and Stochastic Modeling of a Wireless Link in an Industrial Environment. TKN Technical Report Series TKN-01-001, Telecommunication Networks Group, Technical University Berlin, March 2001. <http://www-tnk.ee.tu-berlin.de/publications/tnkrreports.html>.

## Appendix A

# Trace Numbers, Parameters and Main Statistics

In the following table we give for every trace its trace number, its parameters and the packet loss rate (not including ghost packets, missized packets, bit shifted packets). For the remaining packets of a trace (after removing all packets with one of the above impairments) we additionally give the mean bit error rate (MBER) and the packet error rate (PER). As an erroneous packet we count every remaining packet with at least one bit error.

Number	Parameters	Mean BER	PER	PLR
1	QPSK, 504, False	0.000044	0.04313	0.0005
2	QPSK, 504, False	0.000098	0.04713	0.00125
3	QPSK, 504, False	0.000638	0.14767	0.0137
4	QPSK, 504, False	0.000225	0.05052	0.0041
5	QPSK, 504, False	0.001656	0.39464	0.13465
6	QPSK, 504, False	0.000378	0.12043	0.0311
7	QPSK, 504, False	0.000122	0.07497	0.0206
8	QPSK, 504, False	0.000110	0.05087	0.0066
9	QPSK, 504, False	0.000018	0.02827	0.0247
10	QPSK, 504, False	0.000205	0.08612	0.06895
11	QPSK, 504, False	0.000015	0.02249	0.16405
12	QPSK, 504, False	0.000091	0.05397	0.2083
13	QPSK, 504, False	0.000025	0.03588	0.22745
14	QPSK, 504, False	0.000014	0.02667	0.20105
15	QPSK, 504, False	0.000350	0.32328	0.1031
16	QPSK, 504, False	0.000076	0.25412	0.2319
17	QPSK, 504, False	0.000544	0.19411	0.05195
18	QPSK, 504, False	0.000002	0.00090	5e-05
19	QPSK, 504, False	0.000882	0.15277	0.0007
20	QPSK, 504, False	0.000707	0.55777	5e-05
21	QPSK, 504, False	0.000686	0.55007	5e-05

Number	Parameters	Mean BER	PER	PLR
22	QPSK, 504, False	0.000727	0.53820	5e-05
23	QPSK, 504, False	0.000827	0.60458	5e-05
24	QPSK, 504, False	0.000153	0.07834	0.0003
25	QPSK, 504, False	0.000000	0	5e-05
26	QPSK, 504, False	0.000753	0.18066	0.0029
27	QPSK, 504, False	0.000150	0.13106	0.0001
28	QPSK, 504, False	0.000229	0.12119	0.0029
29	QPSK, 504, False	0.000208	0.13085	0.0006
30	QPSK, 504, False	0.000061	0.03376	0.0004
31	QPSK, 504, False	0.000914	0.15544	0.008
32	QPSK, 504, False	0.002796	0.37660	0.0012
33	QPSK, 504, False	0.000451	0.17762	0.00215
34	QPSK, 504, False	0.000488	0.18987	0.00025
35	QPSK, 504, False	0.000899	0.35734	0.0018
36	QPSK, 504, False	0.000249	0.18251	0.00015
37	QPSK, 504, False	0.000140	0.14385	5e-05
38	QPSK, 504, False	0.000712	0.36372	0.00065
39	QPSK, 504, False	0.001082	0.33616	0.03095
40	QPSK, 504, False	0.000180	0.09938	0.0027
41	QPSK, 504, False	0.000218	0.07680	0.00155
42	QPSK, 504, False	0.002057	0.33821	0.00755
43	QPSK, 504, False	0.000536	0.51107	5e-05
44	QPSK, 504, False	0.000715	0.54722	0.0002
45	QPSK, 504, False	0.000704	0.59322	5e-05
46	QPSK, 504, False	0.000667	0.57877	5e-05
47	QPSK, 504, False	0.000614	0.55387	5e-05
48	QPSK, 504, False	0.000670	0.49987	0.0001
49	QPSK, 504, False	0.000922	0.18256	0.00135
50	QPSK, 504, False	0.002404	0.84599	5e-05
51	QPSK, 504, False	0.000087	0.01973	0.0003
52	QPSK, 504, False	0.000025	0.00872	0.00135
53	QPSK, 504, False	0.000048	0.01287	0.00025
54	QPSK, 504, False	0.000000	0.00415	0.0222
55	QPSK, 504, False	0.000000	0.01188	0.01245
56	QPSK, 504, False	0.000000	0.00838	0.00135
57	QPSK, 504, False	0.000000	0.00065	5e-05
58	QPSK, 504, False	0.000000	0.00135	5e-05
59	QPSK, 504, False	0.000000	0.00356	5e-05
60	QPSK, 504, False	0.000012	0.00892	0.0007
61	QPSK, 504, False	0.000010	0.01826	0.00255
62	QPSK, 504, False	0.001059	0.40788	0.02885
63	QPSK, 504, False	0.000757	0.28910	0.05975
64	QPSK, 504, False	0.000325	0.11084	0.01425
65	QPSK, 504, False	0.001939	0.22111	0.0199
66	QPSK, 504, False	0.000733	0.29522	0.02565
67	QPSK, 504, False	0.000370	0.16623	0.1182
68	QPSK, 504, False	0.000623	0.35086	0.02515
69	QPSK, 504, False	0.000206	0.10687	0.1278

Number	Parameters	Mean BER	PER	PLR
70	QPSK, 504, False	0.000052	0.12092	0.01415
71	QPSK, 504, False	0.000119	0.18993	0.0216
72	QPSK, 504, False	0.000048	0.06102	0.00625
73	QPSK, 504, False	0.000824	0.59063	0.0299
74	QPSK, 504, False	0.000751	0.75917	0.1292
75	QPSK, 504, False	0.000072	0.06396	0.00395
76	QPSK, 504, False	0.000271	0.14899	0.02595
77	QPSK, 504, False	0.000006	0.00481	0.0009
78	QPSK, 504, False	0.000007	0.00385	0.00045
79	QPSK, 504, False	0.000000	0	5e-05
80	QPSK, 504, False	0.000005	0.00270	0.0004
81	QPSK, 504, False	0.000000	0	5e-05
82	QPSK, 504, False	0.000004	0.00190	0.0003
83	QPSK, 504, False	0.000004	0.00255	0.0003
84	QPSK, 504, False	0.000000	0	5e-05
85	QPSK, 504, False	0.000000	0	0.00015
86	QPSK, 504, False	0.000000	0	5e-05
87	QPSK, 504, False	0.000005	0.00175	0.00015
88	QPSK, 504, False	0.000000	0	5e-05
89	QPSK, 504, False	0.000007	0.00300	0.00035
90	QPSK, 504, False	0.000058	0.03522	0.0018
91	QPSK, 504, True	0.000000	0	5e-05
92	QPSK, 504, True	0.000000	5.00075e-05	0.00015
93	QPSK, 504, True	0.000013	0.00365	0.0002
94	QPSK, 504, True	0.000000	0	5e-05
95	QPSK, 504, True	0.000000	0	5e-05
96	QPSK, 504, True	0.000000	0.00035	5e-05
97	QPSK, 504, True	0.000000	0	5e-05
98	QPSK, 504, True	0.000000	0	5e-05
99	QPSK, 504, True	0.000000	0	5e-05
100	QPSK, 504, True	0.000023	0.00961	0.00105
101	QPSK, 504, True	0.000344	0.05694	0.0084
102	QPSK, 504, True	0.000025	0.00235	0.0004
103	QPSK, 504, True	0.000000	0.00030	0.00015
104	QPSK, 504, True	0.000000	0	5e-05
105	QPSK, 504, True	0.000014	0.00420	0.0007
106	QPSK, 504, True	0.001115	0.17115	0.01695
107	QPSK, 504, True	0.000456	0.07702	0.00275
108	QPSK, 504, True	0.000052	0.01525	0.00255
109	QPSK, 504, True	0.000011	0.00260	0.0028
110	QPSK, 504, True	0.000125	0.01869	0.00555
111	QPSK, 504, True	0.000196	0.04874	0.0152
112	QPSK, 504, True	0.000000	0	0.00015
113	QPSK, 504, True	0.000887	0.18892	0.012
114	QPSK, 504, True	0.000000	0	5e-05
115	QPSK, 504, True	0.000015	0.00375	0.00075
116	QPSK, 504, True	0.000000	0	0.0001
117	QPSK, 504, True	0.000011	0.00515	0.0015



Number	Parameters	Mean BER	PER	PLR
118	QPSK, 504, True	0.007468	0.83562	0.18445
119	QPSK, 504, True	0.001822	0.26932	0.043
120	QPSK, 504, True	0.000037	0.02099	0.01635
121	QPSK, 504, True	0.000002	0.00135	0.0005
122	QPSK, 504, True	0.000000	0.00010	5e-05
123	QPSK, 504, True	0.002177	0.41120	0.00205
124	QPSK, 504, True	0.000306	0.07494	0.0186
125	QPSK, 504, True	0.001784	0.37324	0.0514
126	QPSK, 504, True	0.000485	0.12317	0.0132
127	QPSK, 504, True	0.000000	0	5e-05
128	QPSK, 504, True	0.000035	0.01121	0.0008
129	QPSK, 504, True	0.000000	0	5e-05
130	QPSK, 504, True	0.000000	0	5e-05
131	QPSK, 504, True	0.000000	0	5e-05
132	QPSK, 504, True	0.000000	0	5e-05
133	QPSK, 504, True	0.000000	0	5e-05
134	QPSK, 504, True	0.000000	0	0.0001
135	QPSK, 504, True	0.000165	0.03182	0.0159
136	QPSK, 504, True	0.000393	0.07694	0.0517
137	QPSK, 504, True	0.000952	0.21247	0.09745
138	QPSK, 504, True	0.001518	0.20153	0.05905
139	QPSK, 504, True	0.000880	0.23849	0.06955
140	QPSK, 504, True	0.001546	0.26314	0.07025
141	QPSK, 504, True	0.001141	0.30171	0.0568
142	QPSK, 504, True	0.001547	0.44510	0.08355
143	QPSK, 504, True	0.001243	0.43963	0.0747
144	QPSK, 504, True	0.001552	0.35113	0.07305
145	QPSK, 504, True	0.000572	0.08861	0.027
146	QPSK, 504, True	0.000306	0.05601	0.0143
147	QPSK, 504, True	0.000004	0.00236	0.00525
148	QPSK, 504, True	0.000000	0	5e-05
149	QPSK, 504, True	0.000005	0.00035	0.00025
150	QPSK, 504, True	0.000000	0	0.00015
151	QPSK, 504, True	0.000000	0	5e-05
152	QPSK, 504, True	0.000000	0	5e-05
153	QPSK, 504, True	0.000000	0	5e-05
154	QPSK, 504, True	0.000000	0	0.0001
155	QPSK, 504, True	0.000000	0	0.0002
156	QPSK, 504, True	0.000000	0	0.00015
157	QPSK, 504, True	0.000009	0.00345	0.0004
158	QPSK, 504, True	0.000233	0.08099	0.0193
159	QPSK, 504, True	0.000029	0.00587	0.0023
160	QPSK, 504, True	0.000000	0.00010	0.00095
161	QPSK, 504, True	0.000000	0	0.00025
162	QPSK, 504, True	0.000000	0	0.0007
163	QPSK, 504, True	0.000000	5.00675e-05	0.0009
164	QPSK, 504, True	0.000005	0.00495	0.00965
165	QPSK, 504, True	0.000207	0.05008	0.0348

Number	Parameters	Mean BER	PER	PLR
166	QPSK, 504, True	0.000369	0.08900	0.0439
167	QPSK, 504, True	0.000036	0.01829	0.0268
168	QPSK, 504, True	0.000042	0.01214	0.01535
169	QPSK, 504, True	0.000007	0.00430	0.0117
170	QPSK, 504, True	0.000004	0.00125	0.00015
171	QPSK, 504, True	0.000000	0	5e-05
172	QPSK, 504, True	0.000000	0	0.0001
173	QPSK, 504, True	0.000006	0.00145	0.00075
174	QPSK, 504, True	0.000001	0.00040	5e-05
175	QPSK, 504, True	0.000016	0.00410	0.00045
176	QPSK, 504, True	0.000018	0.00330	0.0011
177	QPSK, 504, True	0.000000	0	5e-05
178	QPSK, 504, True	0.000000	0	0.0001
179	QPSK, 504, True	0.000799	0.40688	0.02705
180	QPSK, 504, True	0.000036	0.02320	0.02055

Table A.1: Mapping of trace numbers to measurement parameters for **longterm2** measurement

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