APPENDIX C. PERFORMANCE DATA FROM INITIAL PHASE OF TRIAL NETWORK

Figures C-1 through C-7 show cell delay variation for a 6-meter loopback cable and for one to six cascaded switches (as described in Section 6). The histograms were created using delay measurements from groups of 4096 consecutive cells. A group of cells was captured at 5-minute intervals for a period of 3 hours. Thus, delay measurements for 147,456 cells were used to create the histograms. The bin width of the histograms is 250 ns.

Figures C-8 through C-14 show cell transfer delay for a 6-meter loopback cable and for one to six cascaded switches (as described in Section 6). Statistics were calculated from groups of 4096 consecutive cells. Statistics include maximum, minimum, mean, and plus/minus one standard deviation. Groups of cells were captured at 5-minute intervals for a period of 3 hours. Thus, each graph consists of 36 sets of the statistics described above. On the graphs, the heavy line indicates the mean; plus/minus one standard deviation is indicated by the shaded area, and the dashed lines indicate the maximum and minimum.

Figure C-15 shows network utilization results for September 8 and September 15, 1994. The procedure for conducting this measurement is described in Section 6. The graph shows a time history of the busiest network link throughout the day of testing. The time resolution of the graphs is 5 minutes.

Finally, Table C-1 provides a synopsis of the CLRs observed in the experiment. Note that for any given number of switches, the CLR increases monotonically as the data rate increases. It is also generally true that for a given data rate, the CLR increases monotonically as the number of switches increases, although there are two exceptions to this rule (i.e., 5 switches at 100.0 Mbit/s and 6 switches at 149.76 Mbit/s). This is most likely due to load variations in the network.

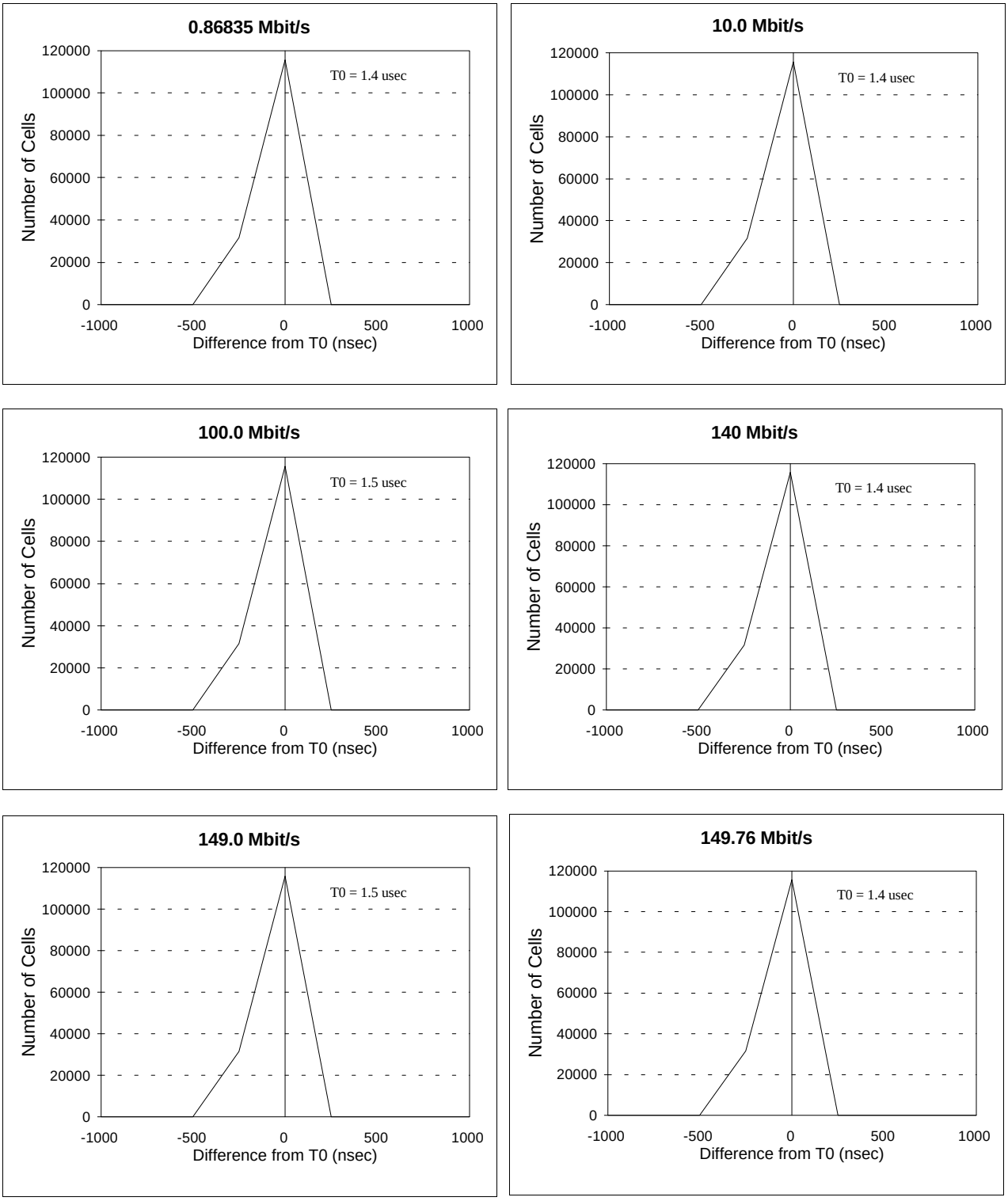


Figure C-1. ATM cell delay variation through a 6-meter single mode fiber loopback cable.

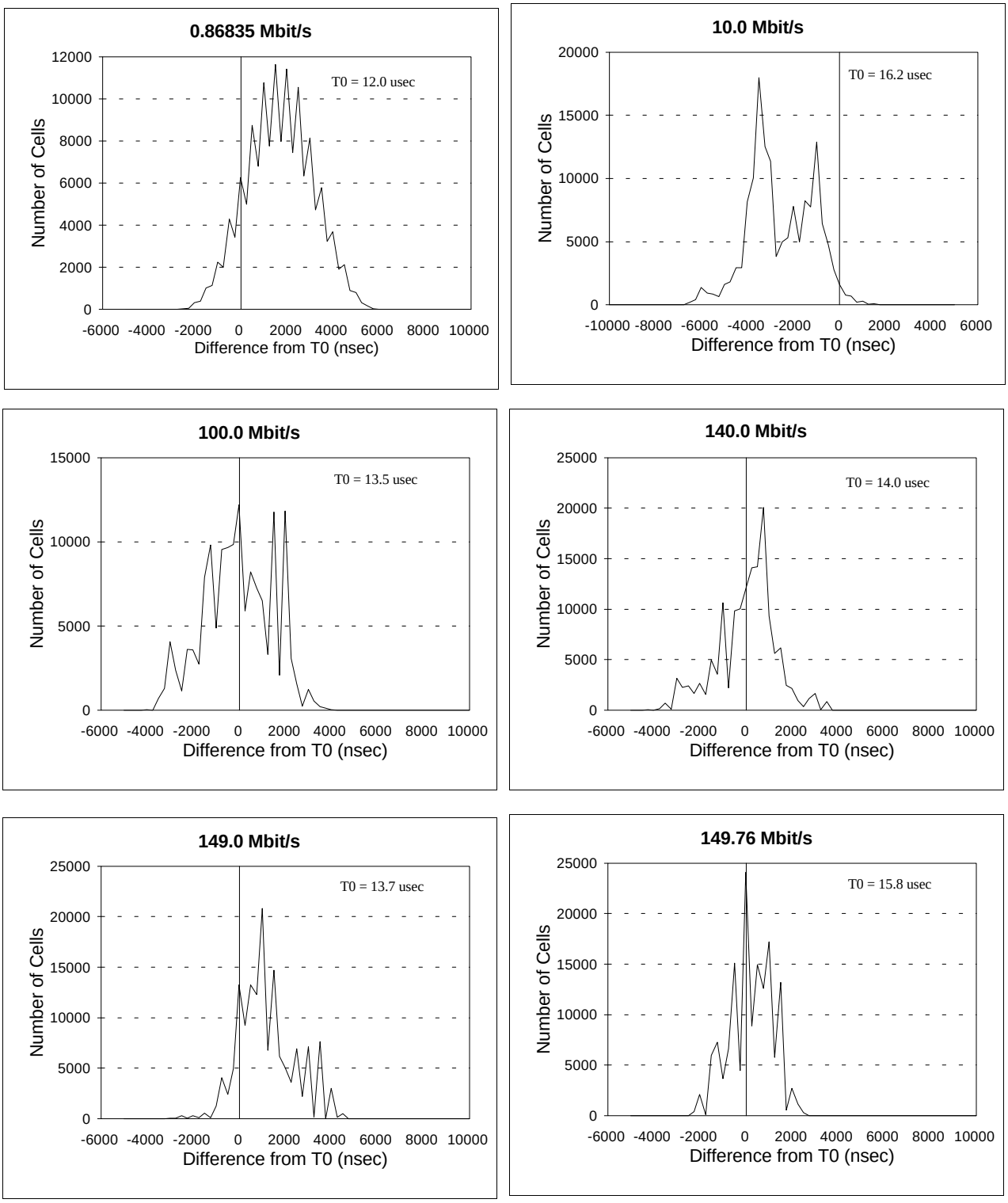


Figure C-2. ATM cell delay variation for one switch.

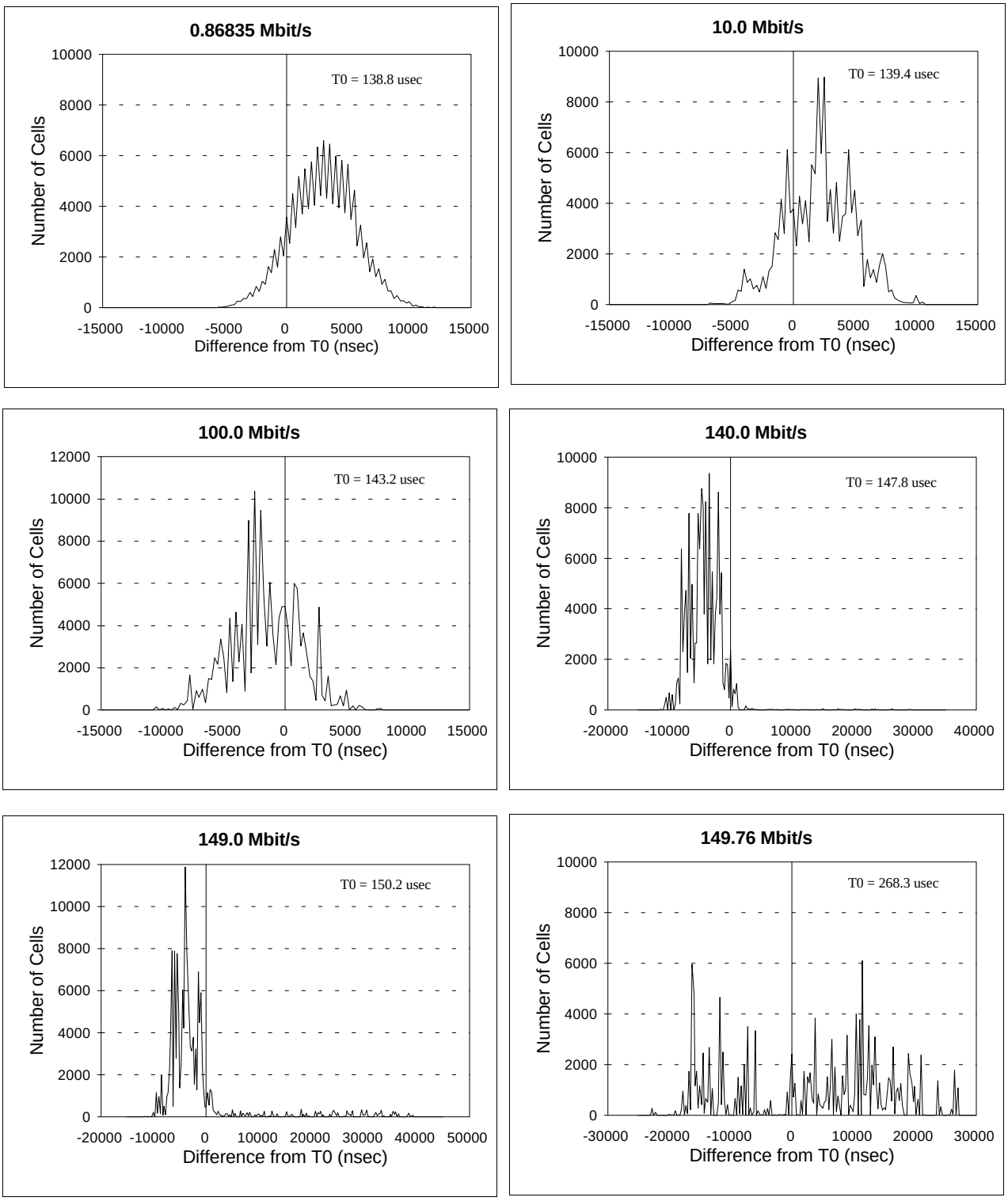


Figure C-3. ATM cell delay variation for two switches.

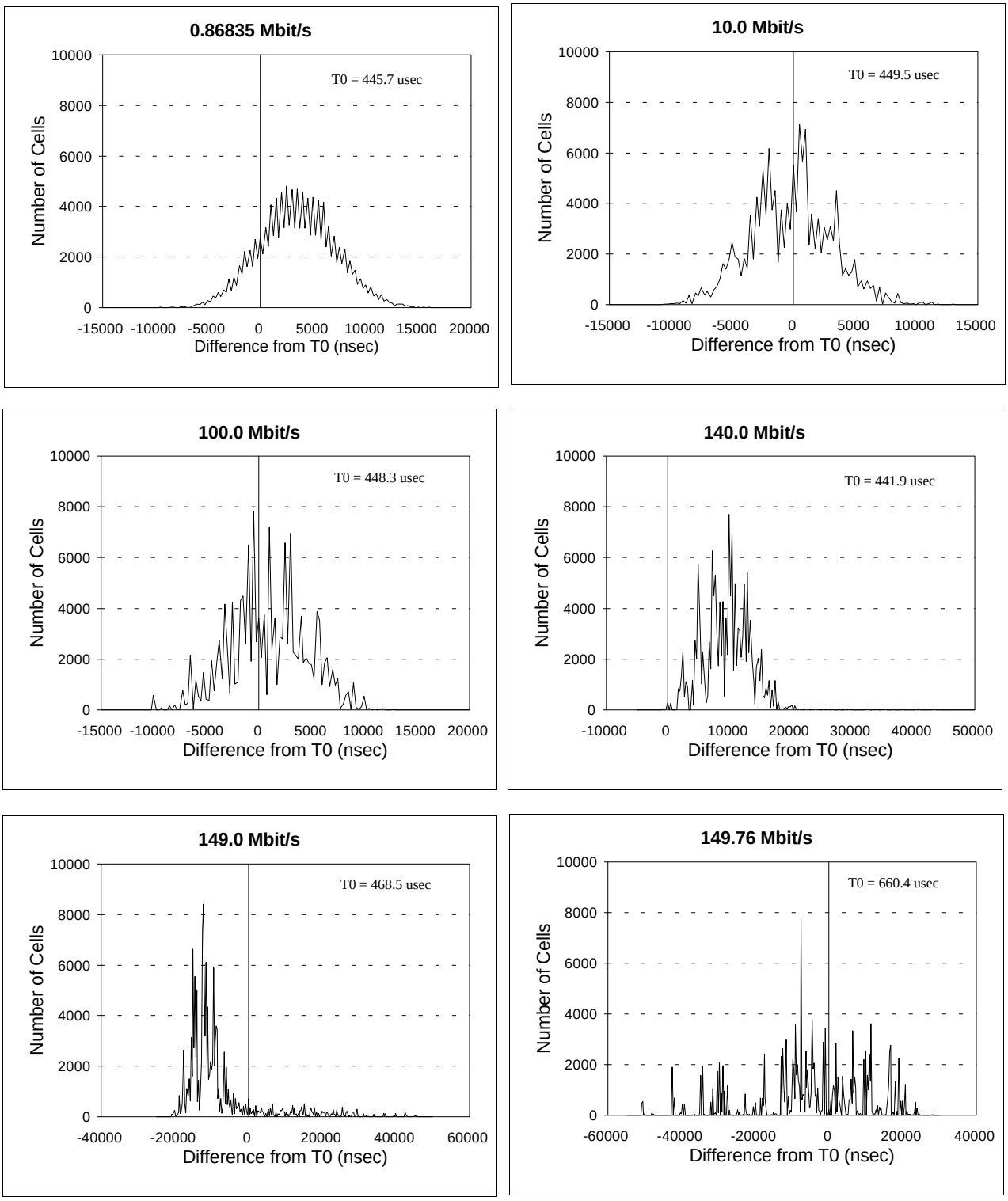


Figure C-4. ATM cell delay variation for three switches.

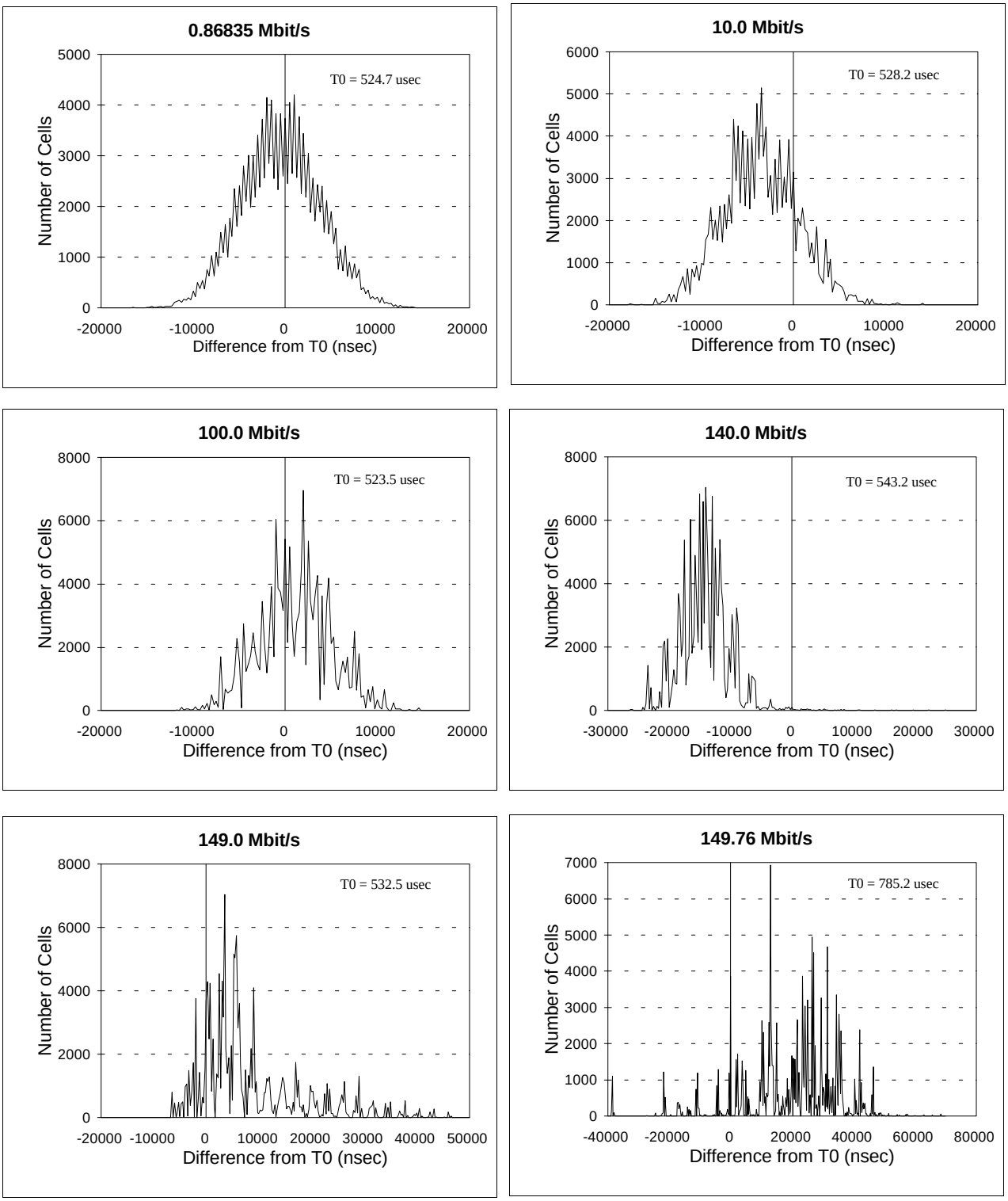


Figure C-5. ATM cell delay variation for four switches.

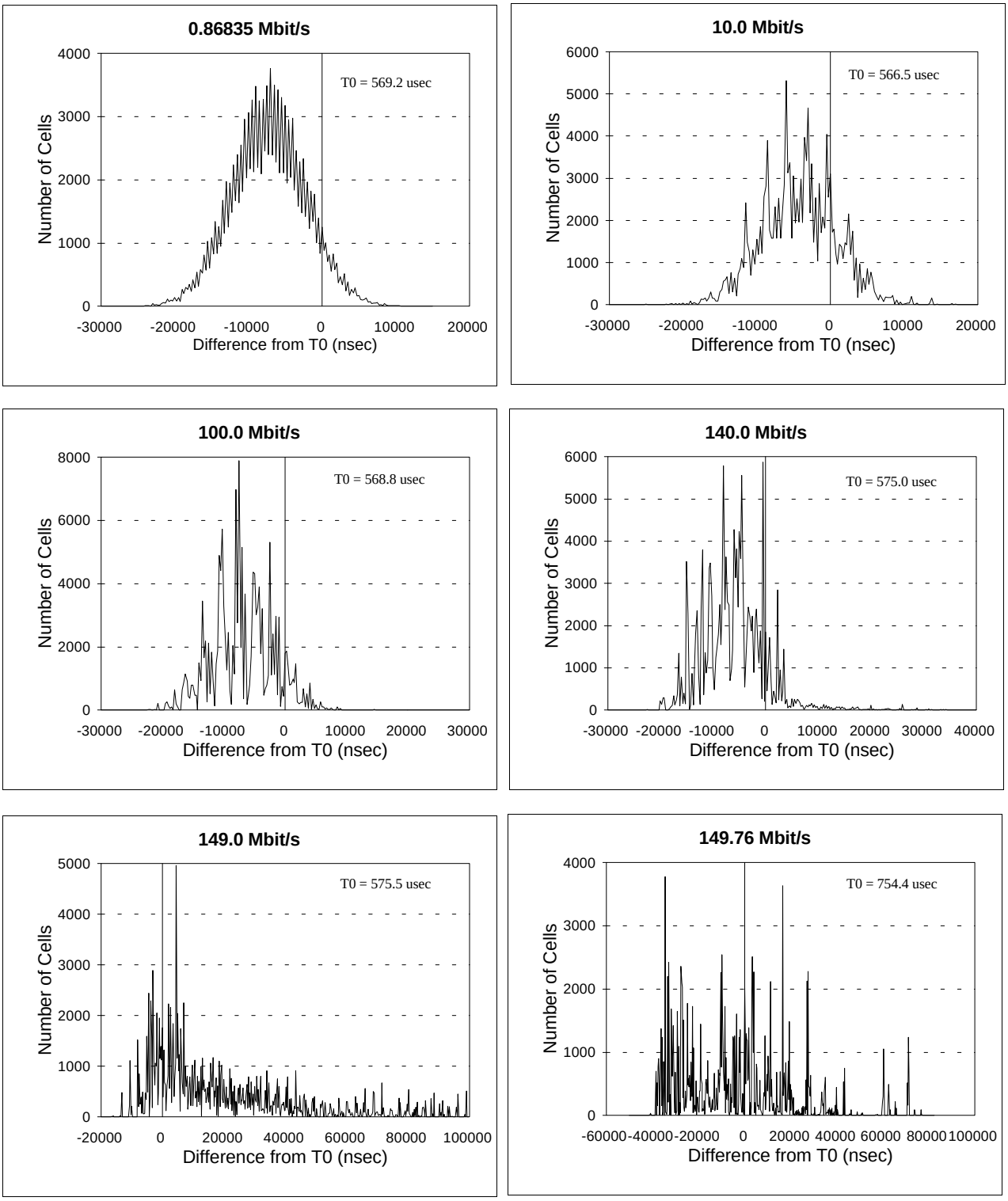


Figure C-6. ATM cell delay variation for five switches.

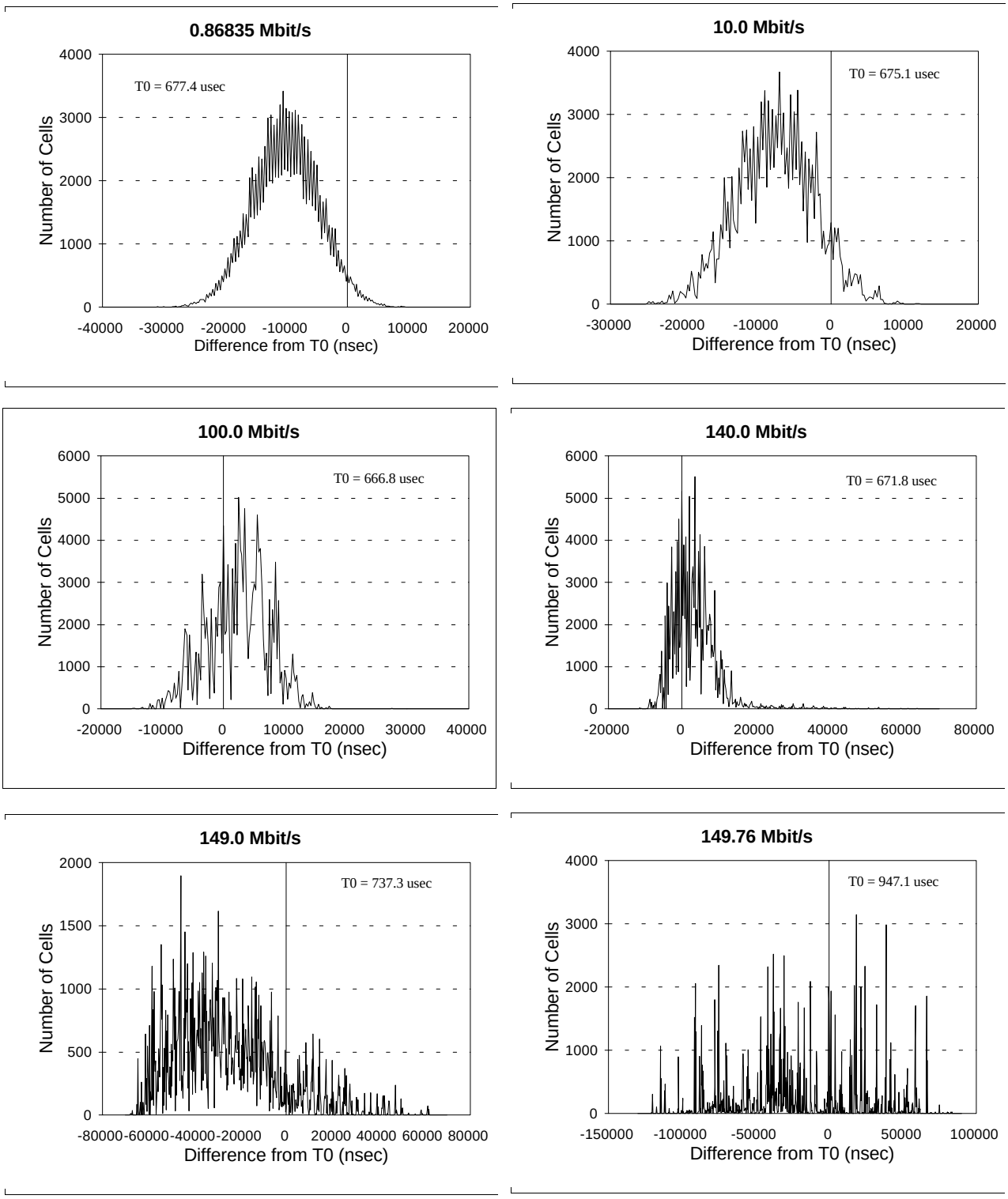


Figure C-7. ATM cell delay variation for 6 switches

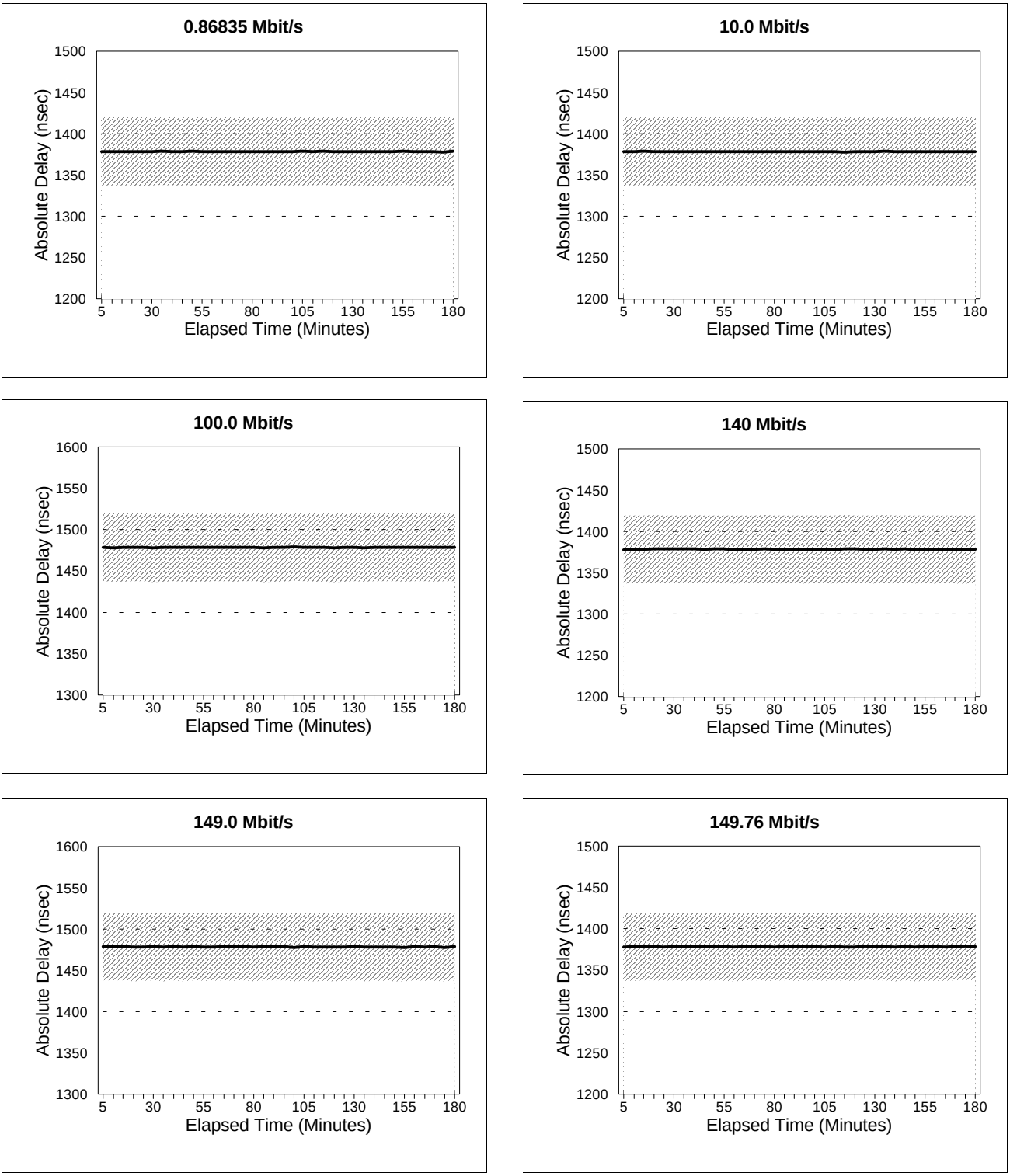


Figure C-8. ATM cell transfer delay versus time through a 6-meter single mode fiber loopback cable (dark line = mean; dotted lines = max and min, shaded area = +/- 1 standard deviation).

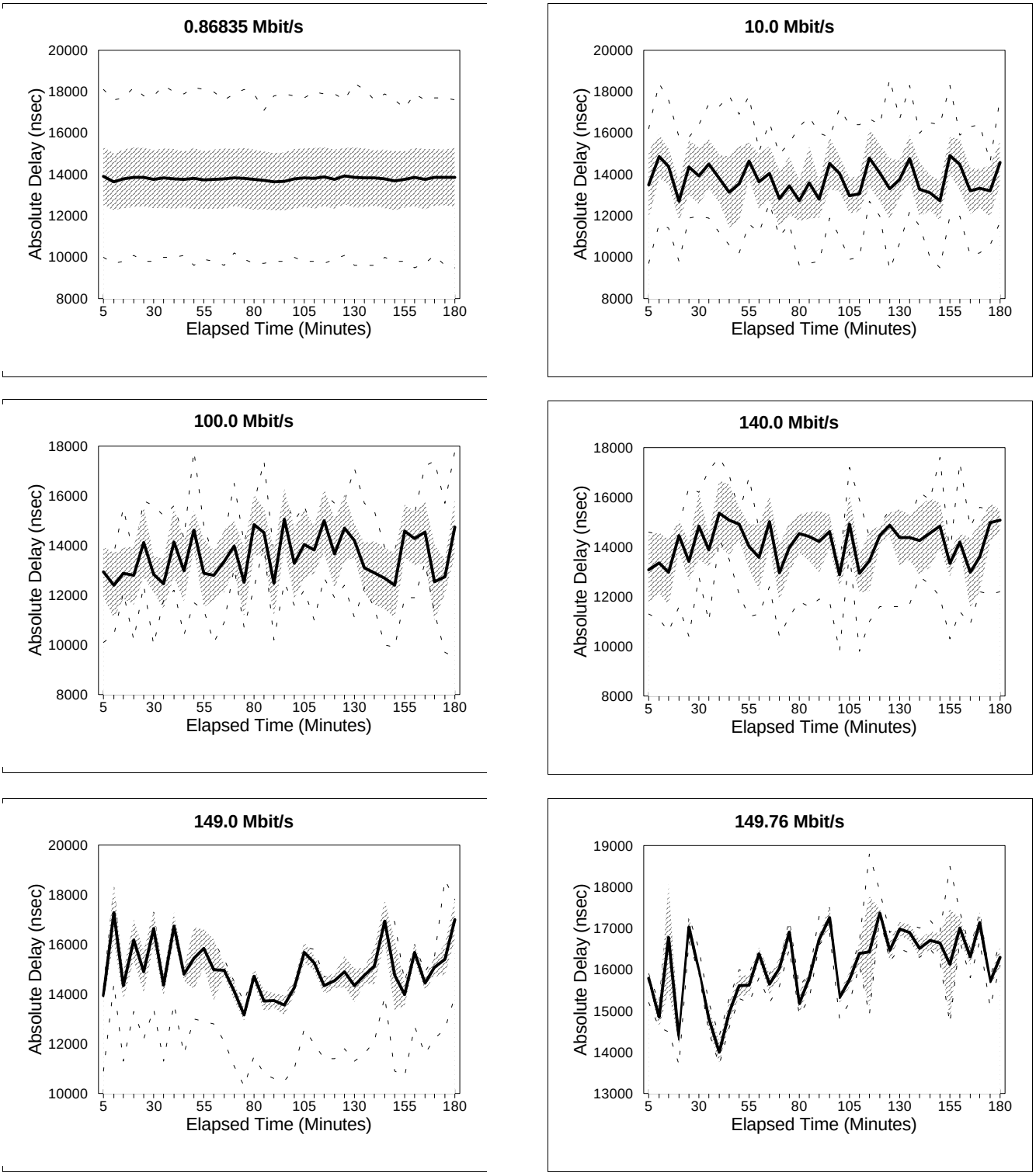


Figure C-9. ATM cell transfer delay versus time for one switch (dark line = mean; dotted lines = max and min; shaded area = +/- 1 standard deviation).

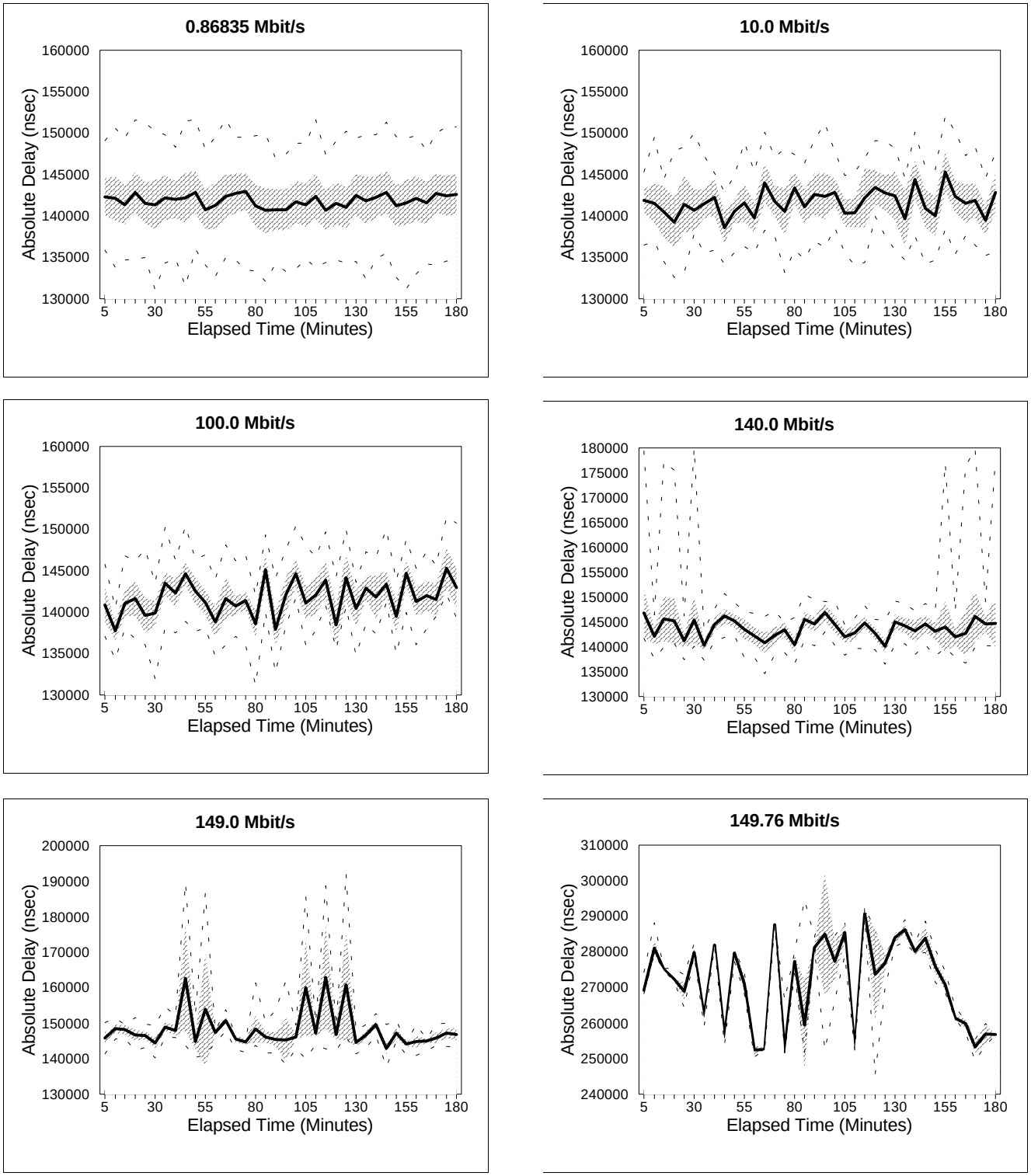


Figure C-10. ATM cell transfer delay versus time for two switches (dark line = mean; dotted lines = max and min; shaded area = +/- 1 standard deviation).

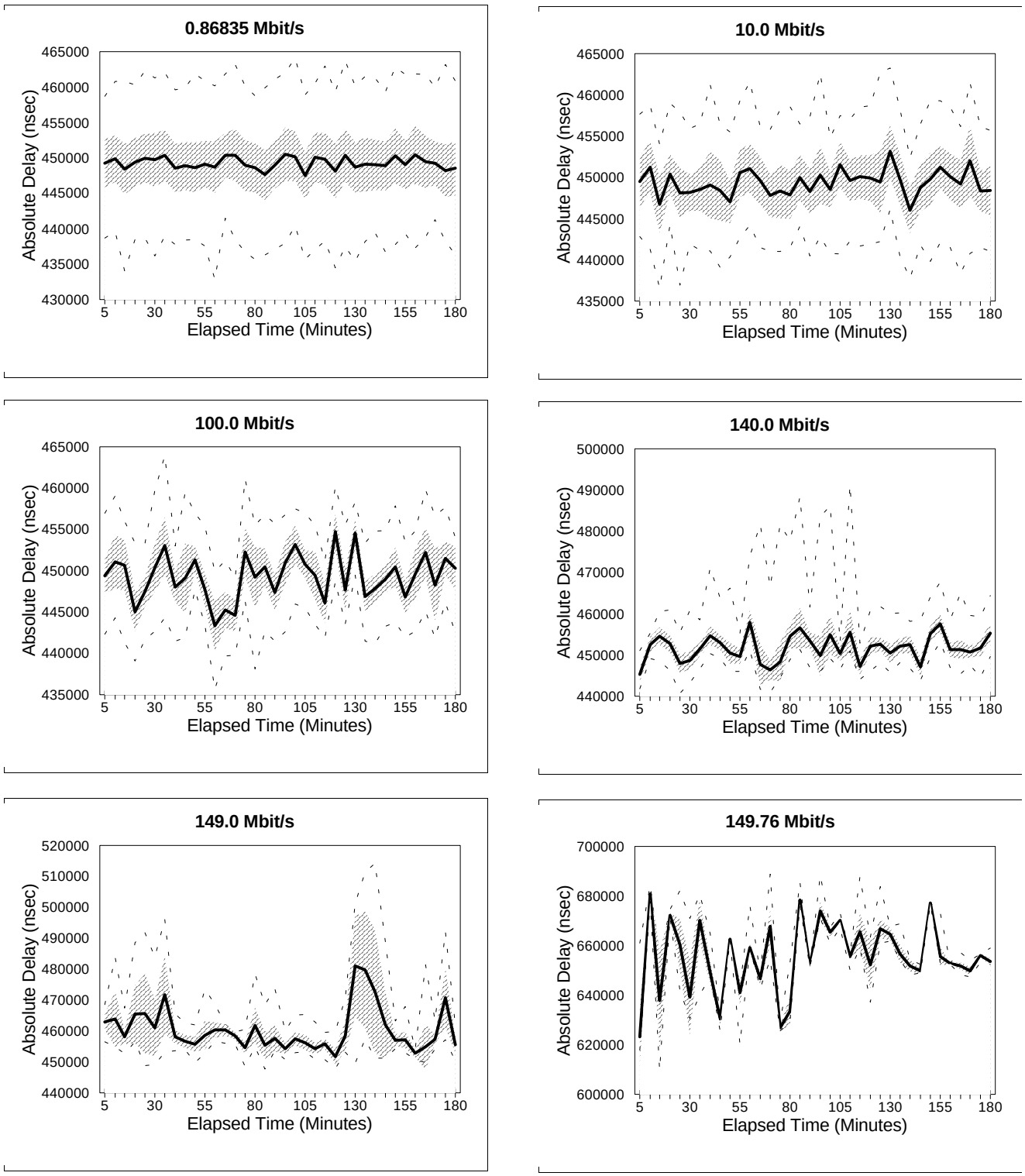


Figure C-11. ATM cell transfer delay versus time for three switches (dark line = mean; dotted lines = max and min; shaded area = +/- 1 standard deviation).

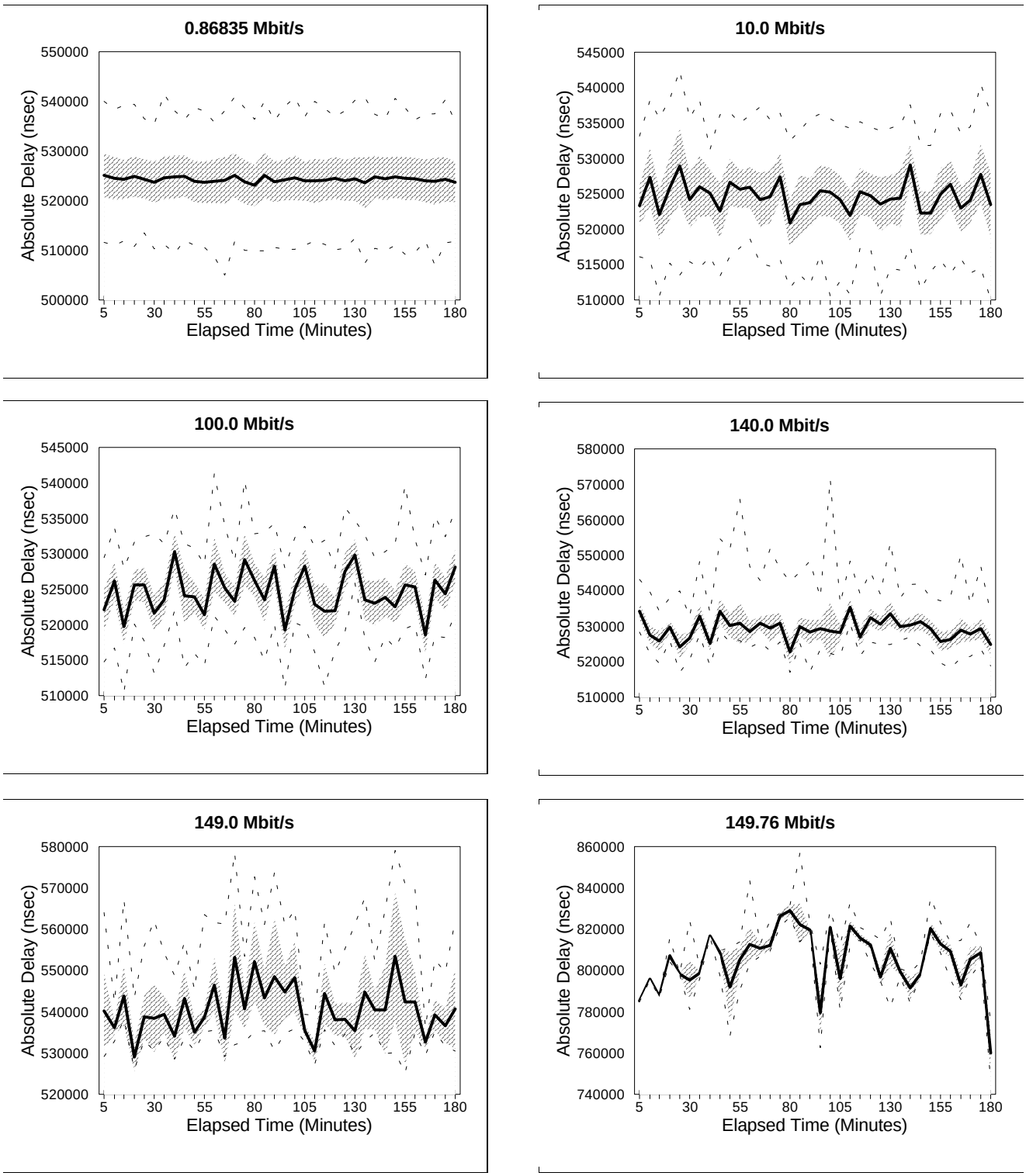


Figure C-12. ATM cell transfer delay versus time for four switches (dark line = mean; dotted lines = max and min; shaded area = +/- 1 standard deviation).

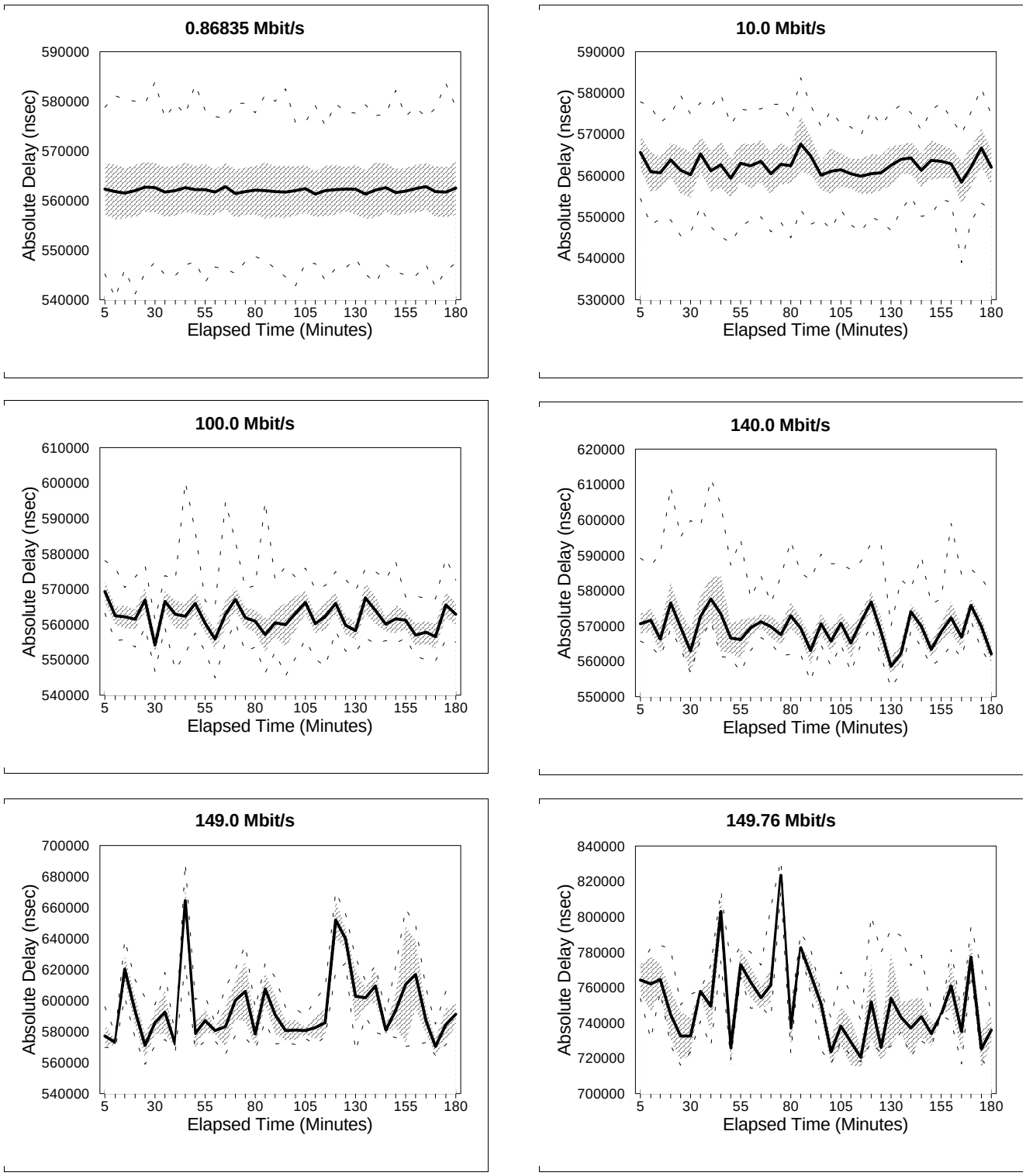


Figure C-13. ATM cell transfer delay versus time for five switches (dark line = mean; dotted lines = max and min; shaded area = +/- 1 standard deviation).

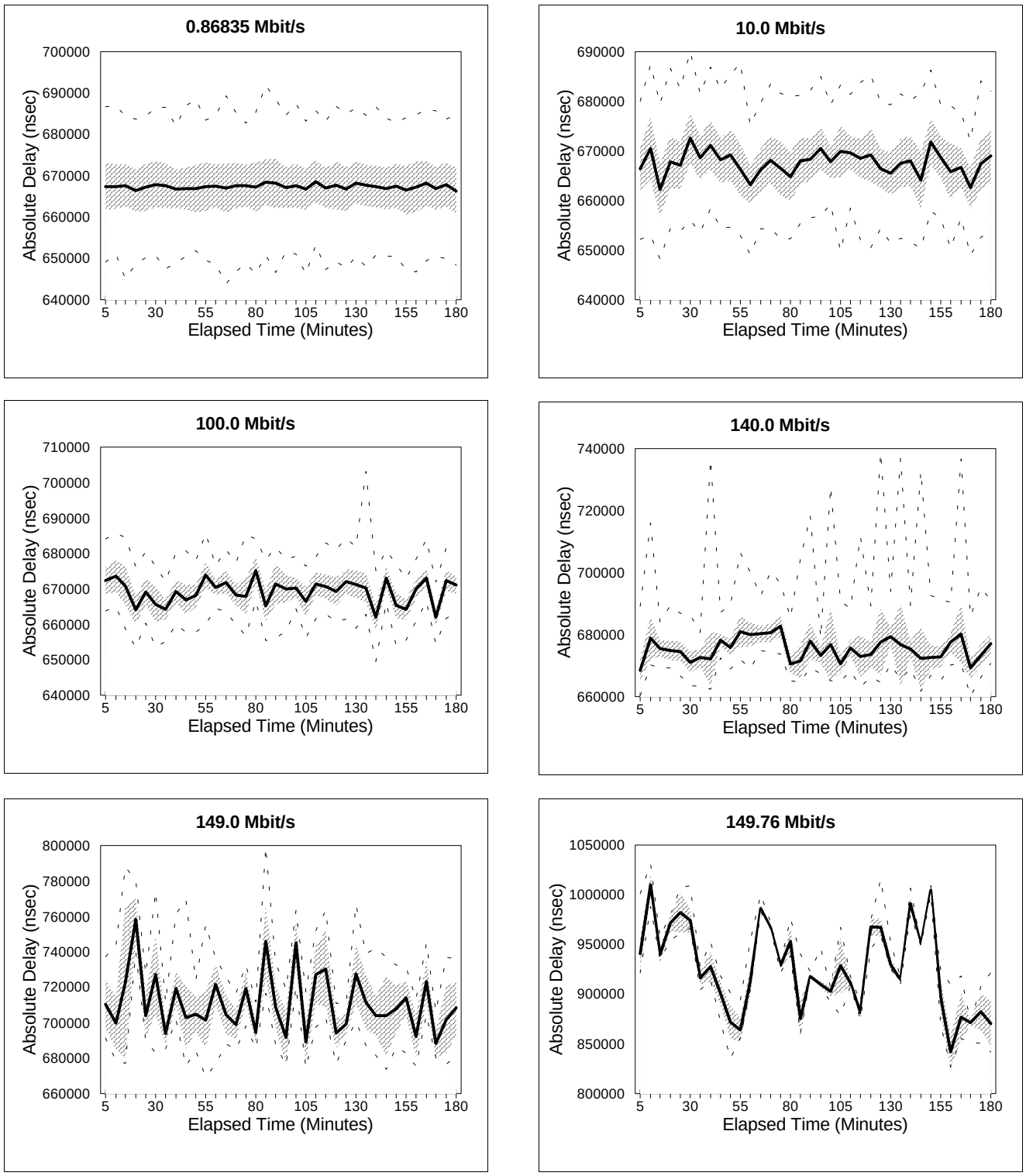
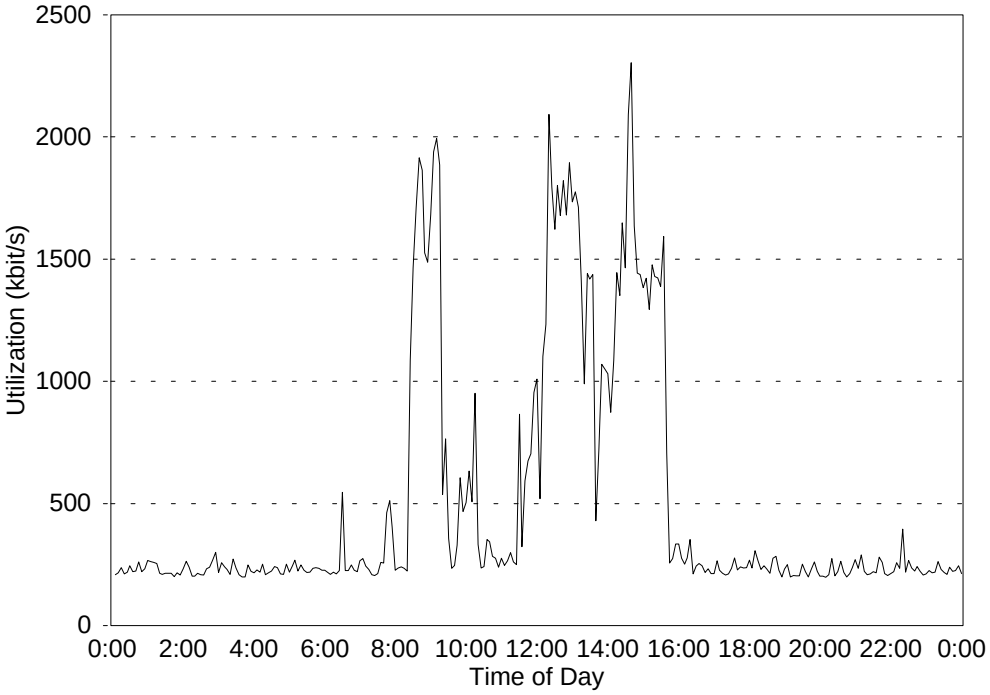
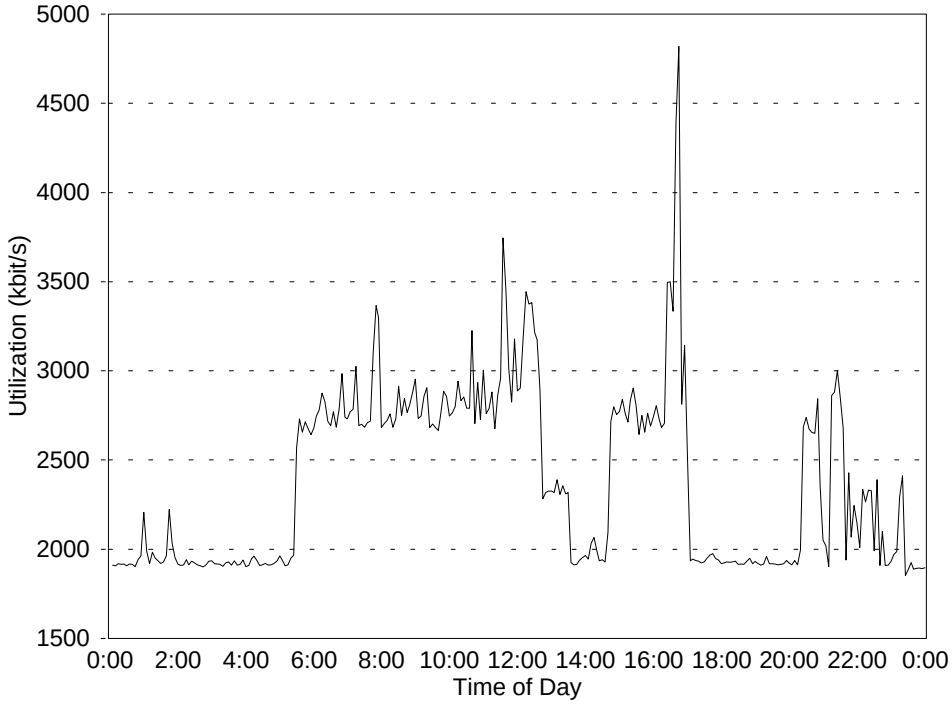


Figure C-14. ATM cell transfer delay versus time for six switches (dark line = mean; dotted lines = max and min; shaded area = +/- 1 standard deviation).



a. Utilization on September 8, 1994



b. Utilization on September 15, 1994

Figure C-15. Network utilization on September 8, 1994 and September 15, 1994

Table C-1. Cell Loss Ratios in Phase 1

	Data Rate (Mbit/s)					
Number of Switches	0.86835	10.0	100.0	140.0	149.0	149.76
0	0.0	0.0	0.0	0.0	0.0	0.0
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	$2.7*10^{-8}$	$5.6*10^{-6}$	$4.3*10^{-4}$
3	0.0	0.0	$7.9*10^{-10}$	$1.6*10^{-6}$	$1.6*10^{-5}$	$1.0*10^{-3}$
4	0.0	0.0	$1.9*10^{-8}$	$3.6*10^{-6}$	$3.8*10^{-5}$	$1.4*10^{-3}$
5	0.0	0.0	$5.5*10^{-9}$	$1.2*10^{-5}$	$8.0*10^{-5}$	$4.0*10^{-3}$
6	0.0	0.0	$2.0*10^{-8}$	$3.8*10^{-4}$	$8.1*10^{-4}$	$2.6*10^{-3}$