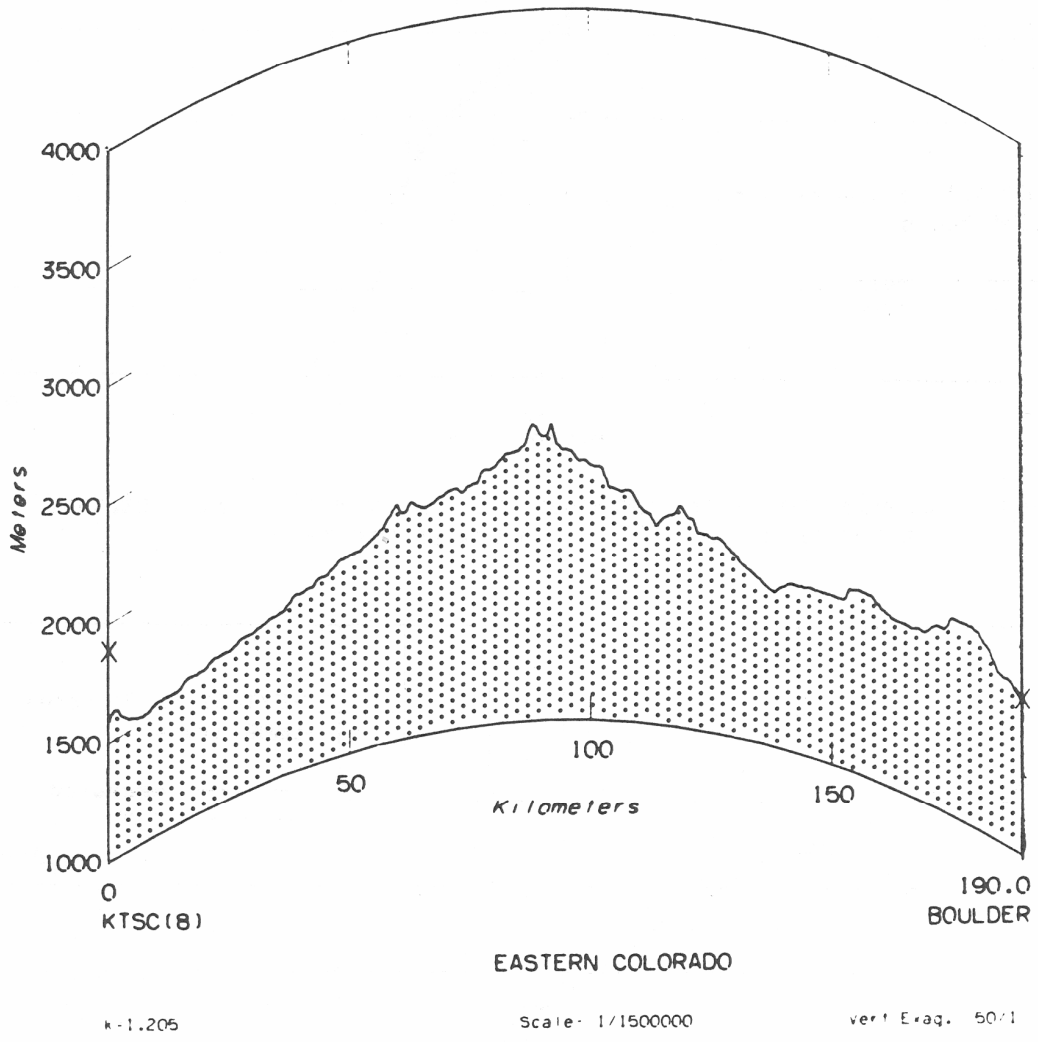

Figure 15. Terrain profile: KTSC(8) to Boulder.

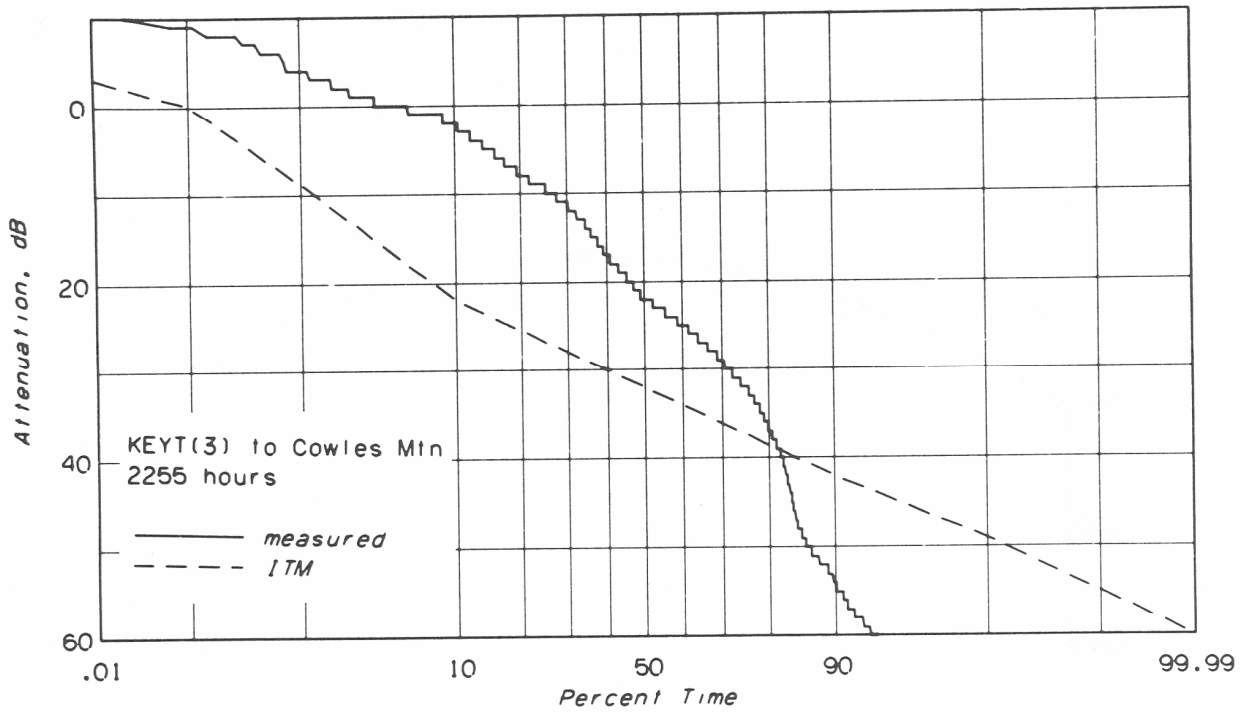

Figure 16. Cumulative distribution of the hourly median data obtained on the path from KEYT(3) to Cowles Mountain.

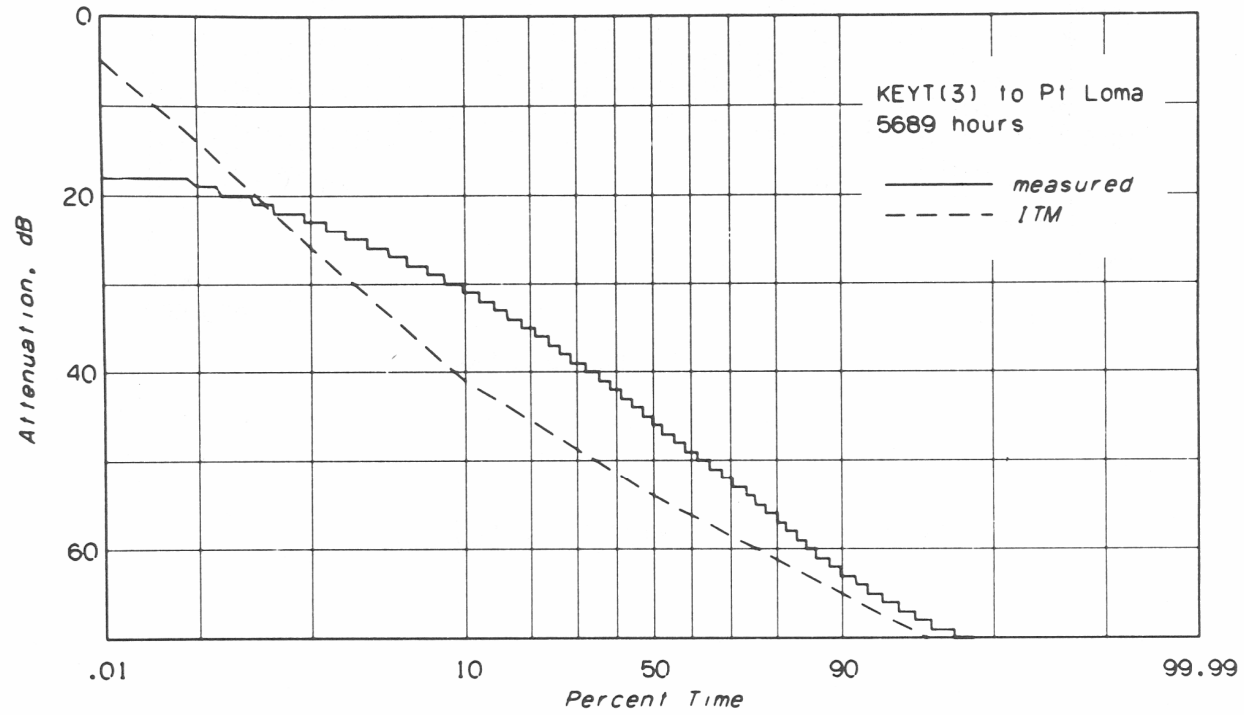

Figure 17. Cumulative distribution of the hourly median data obtained on the path from KEYT(3) to Point Loma.

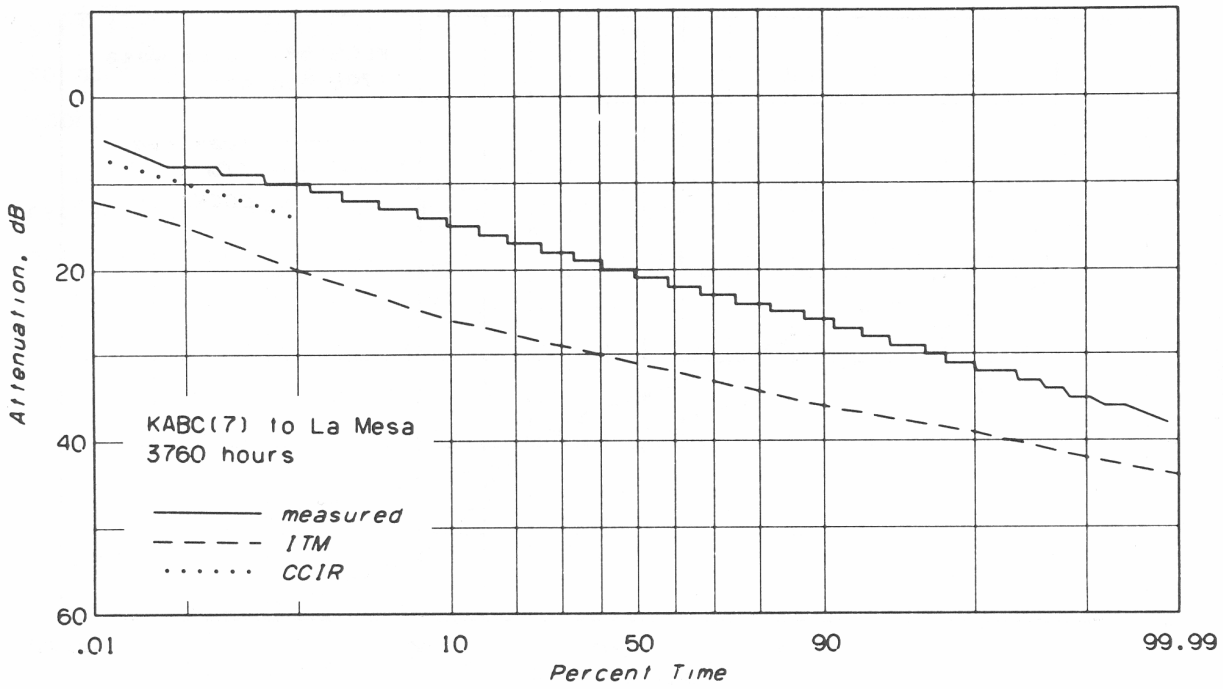

Figure 18. Cumulative distribution of the hourly median data obtained on the path from KABC(7) to La Mesa.

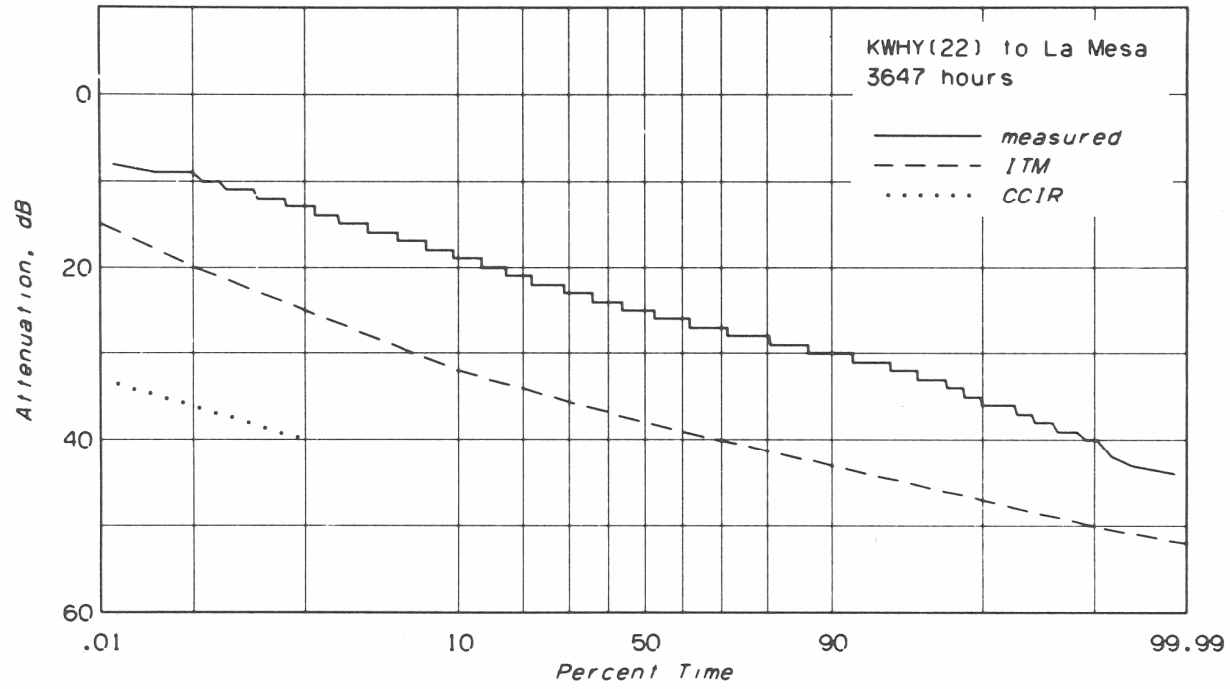

Figure 19. Cumulative distribution of the hourly median data obtained on the path from KWHY(22) to La Mesa.

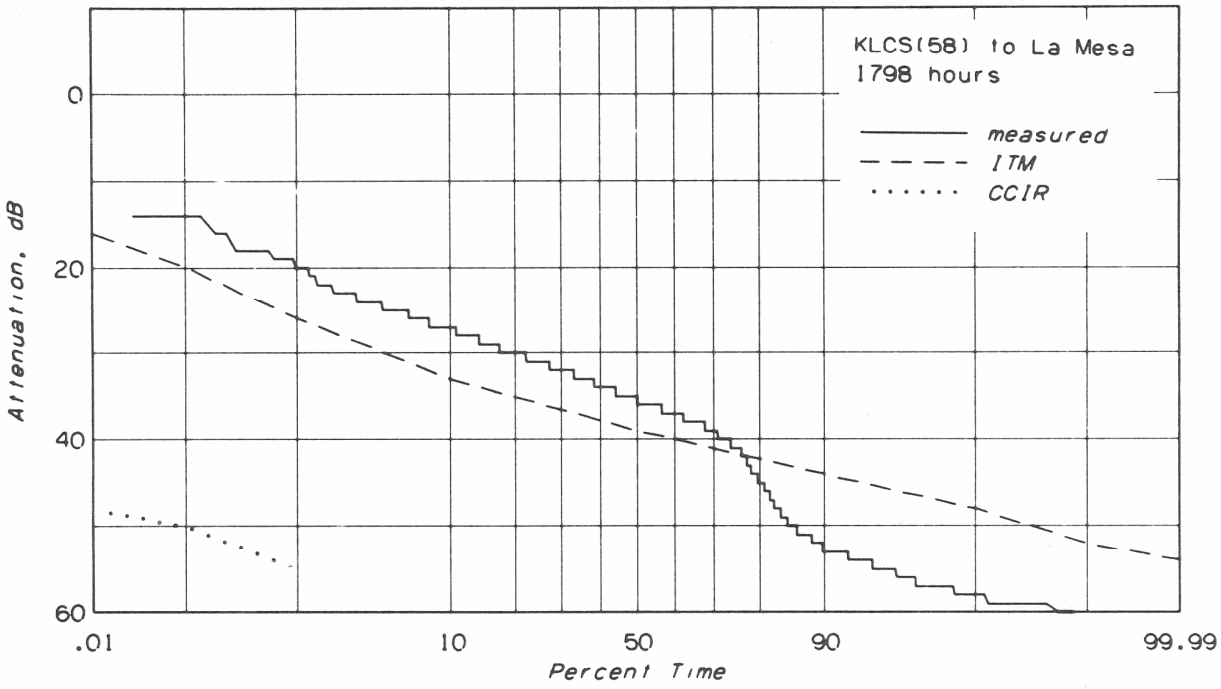

Figure 20. Cumulative distribution of the hourly median data obtained on the path from KLCS(58) to La Mesa.

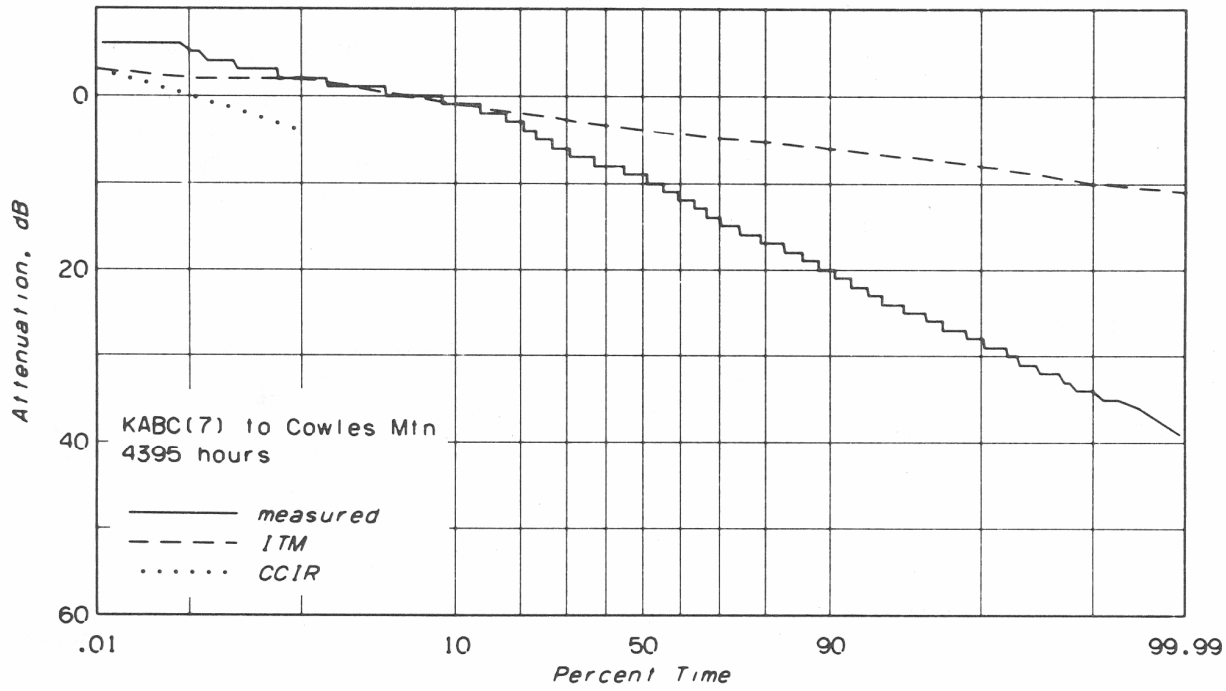

Figure 21. Cumulative distribution of the hourly median data obtained on the path from KABC(7) to Cowles Mountain.

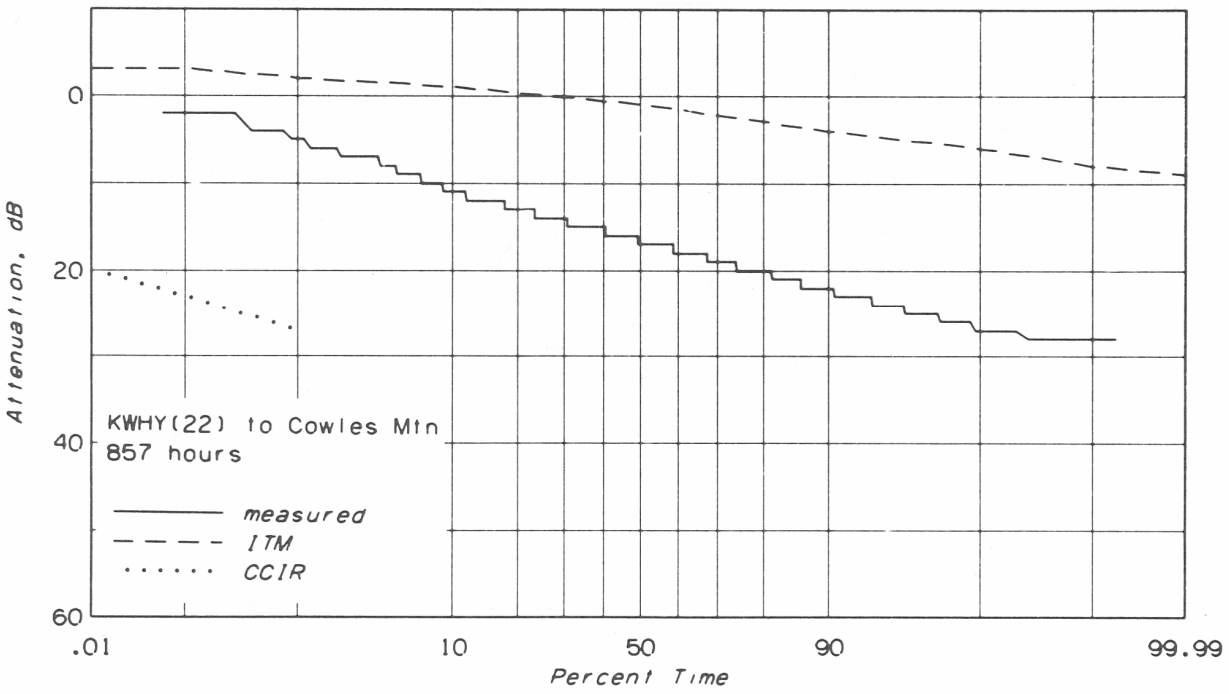

Figure 22. Cumulative distribution of the hourly median data obtained on the path from KWHY(22) to Cowles Mountain.

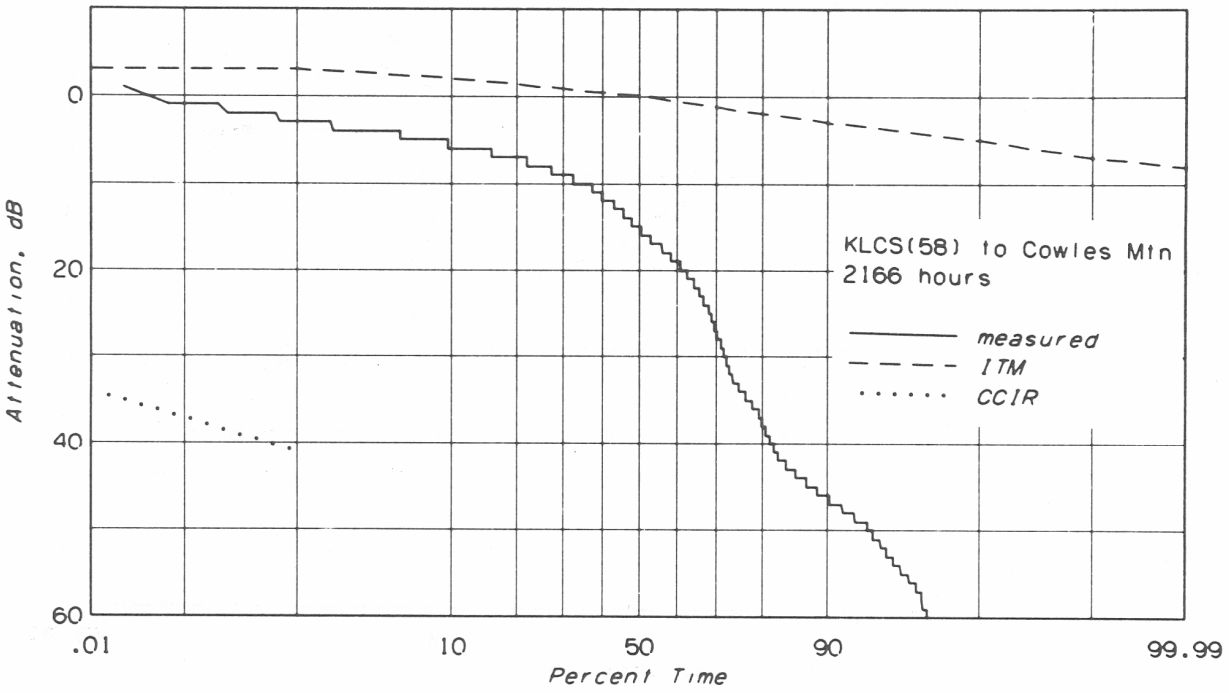

Figure 23. Cumulative distribution of the hourly median data obtained on the path from KLCS(58) to Cowles Mountain.

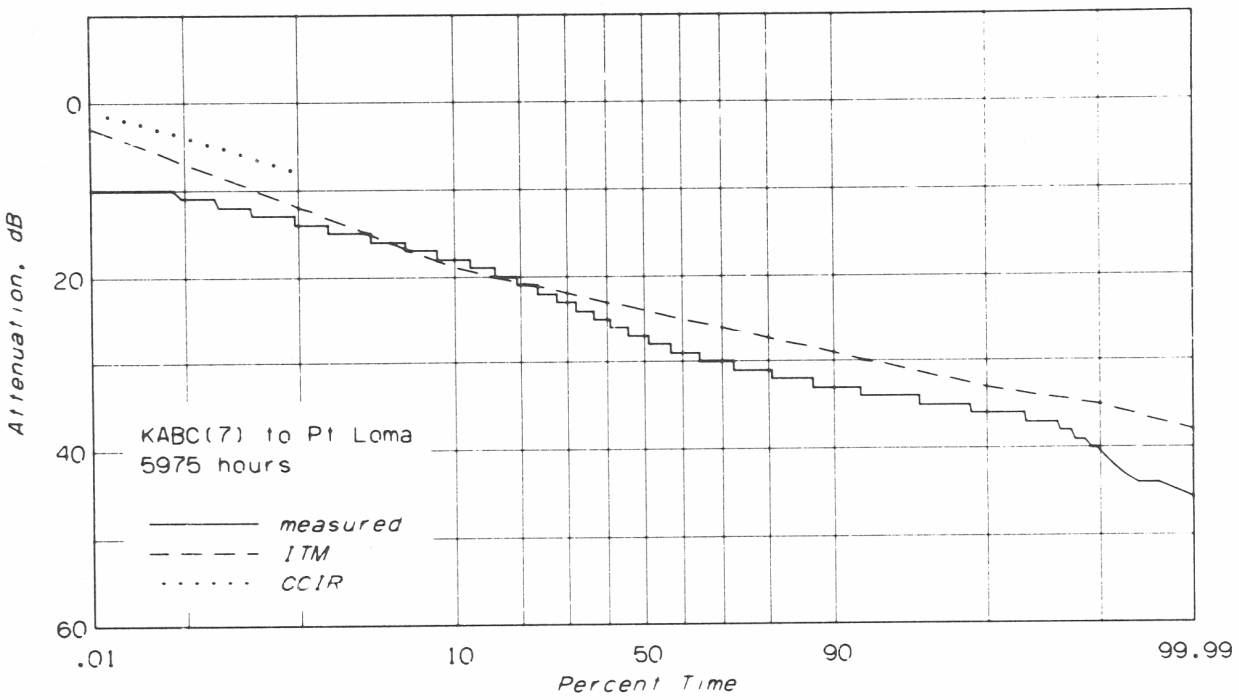

Figure 24. Cumulative distribution of the hourly median data obtained on the path from KABC(7) to Point Loma.

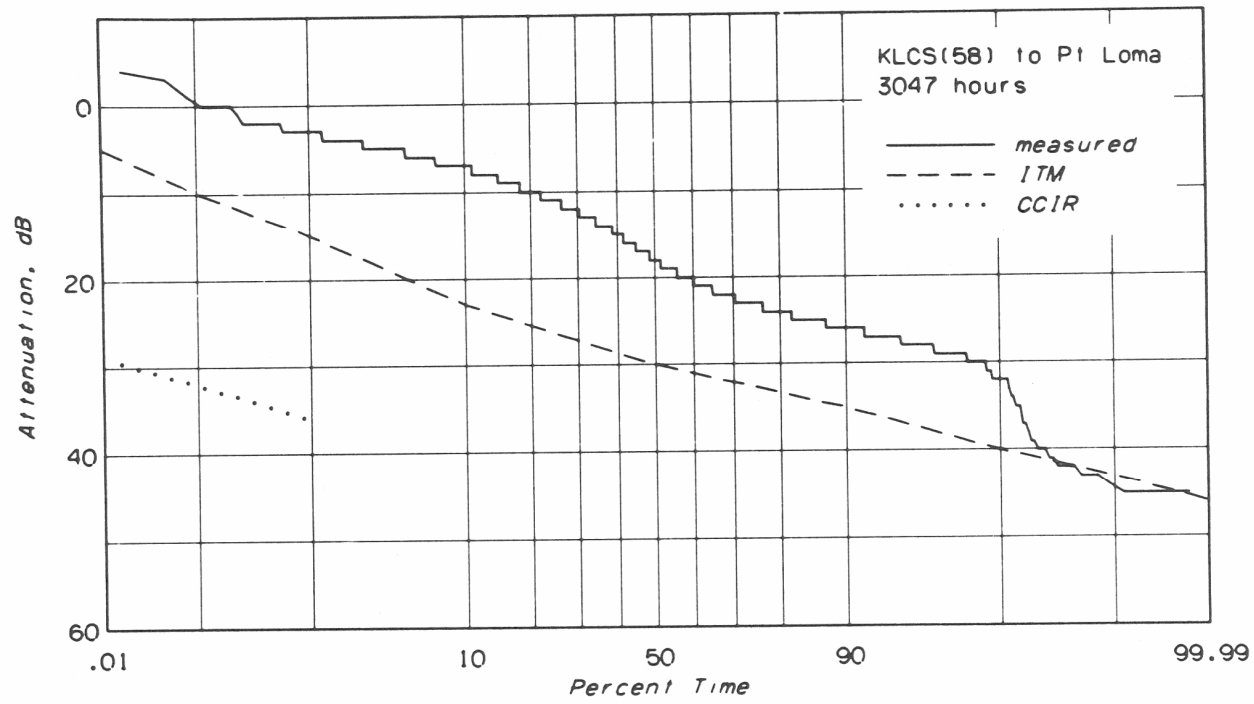

Figure 25. Cumulative distribution of the hourly median data obtained on the path from KLCS(58) to Point Loma.

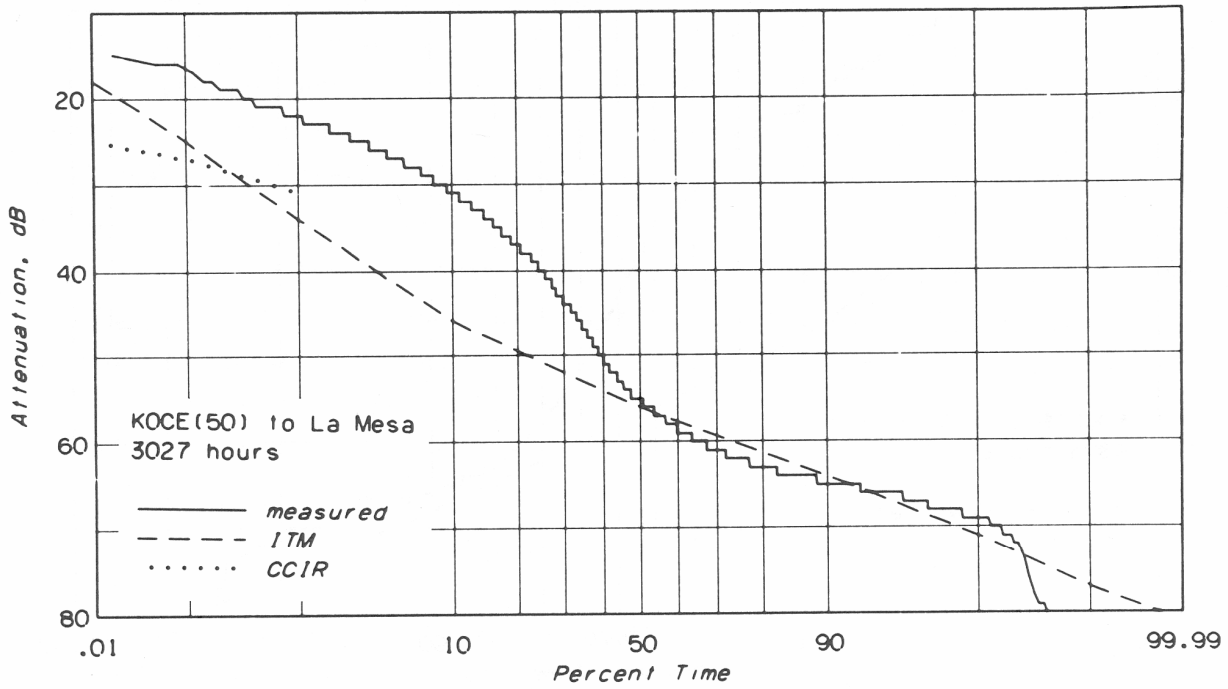

Figure 26. Cumulative distribution of the hourly median data obtained on the path from KOCE(50) to La Mesa.

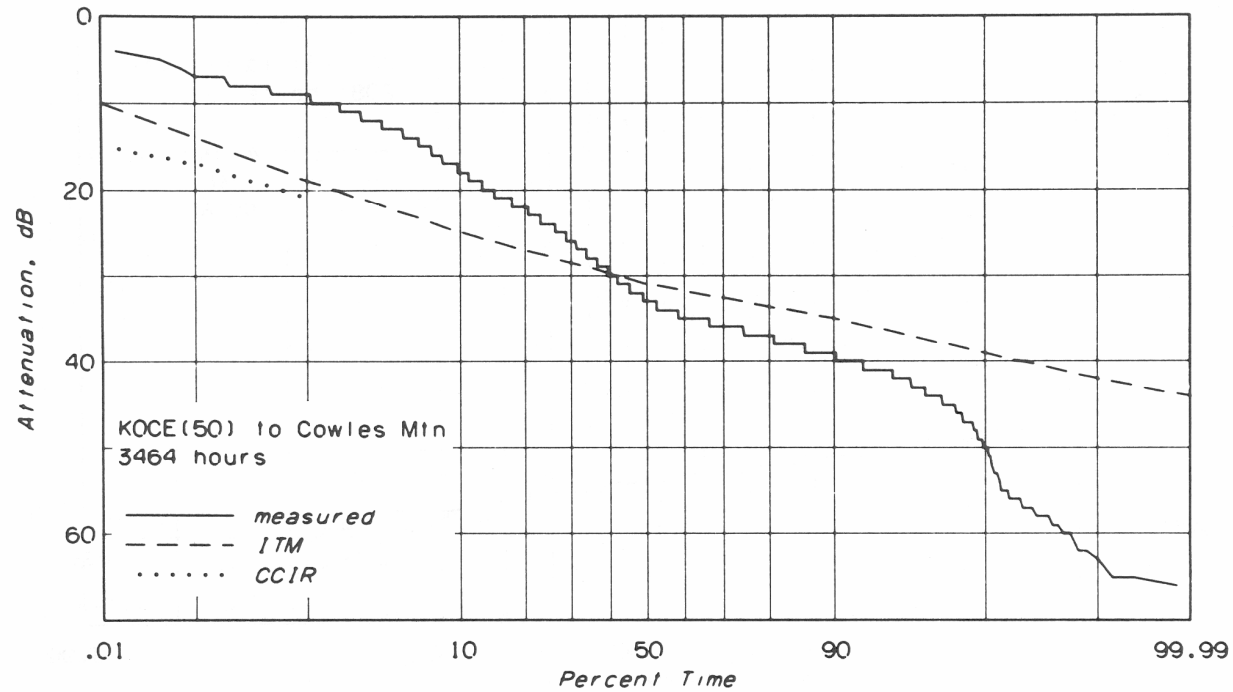

Figure 27. Cumulative distribution of the hourly median data obtained on the path from KOCE(50) to Cowles Mountain.

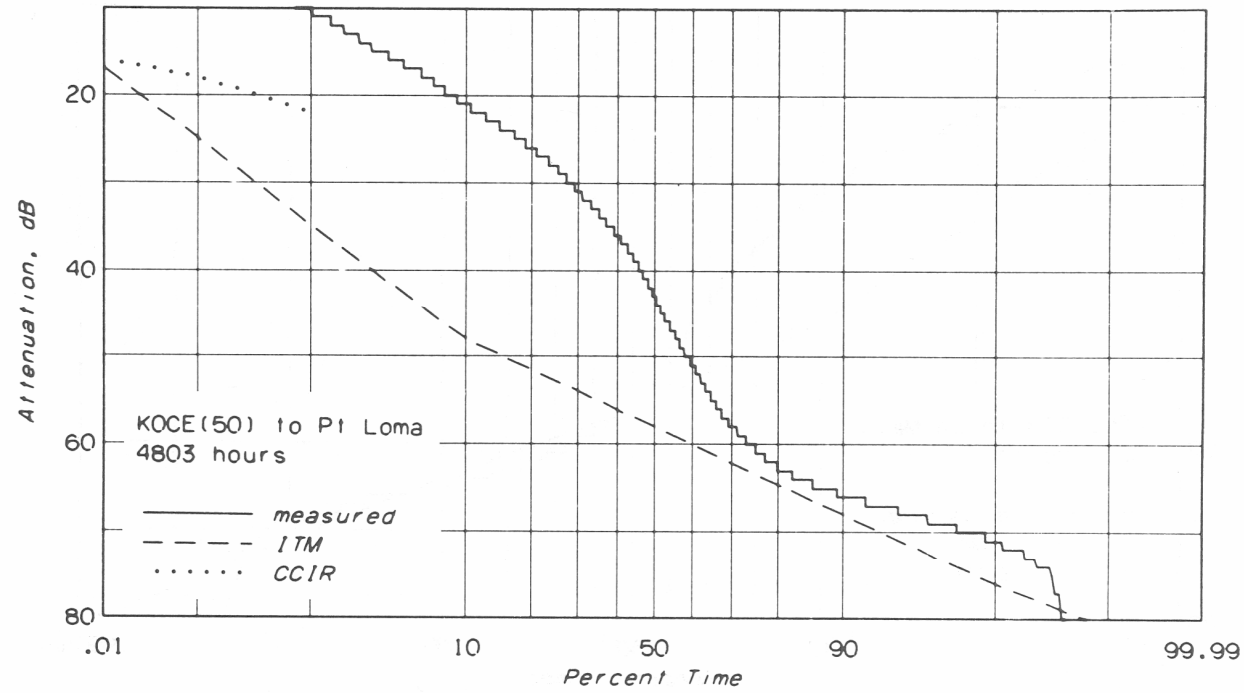

Figure 28. Cumulative distribution of the hourly median data obtained on the path from KOCE(50) to Point Loma.

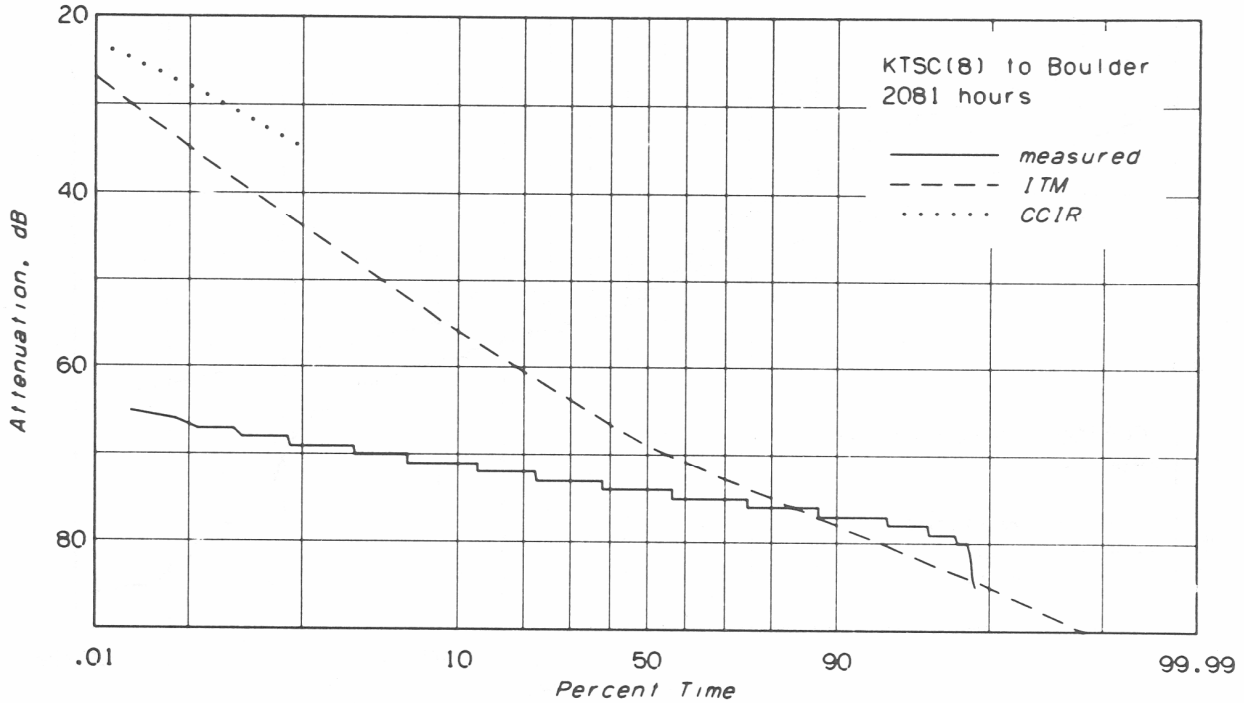

Figure 29. Cumulative distribution of the hourly median data obtained on the path from KTSC(8), Pueblo, to Boulder.

Cumulative distributions corresponding to the eight paths from Mount Wilson are in Figures 18 through 25. It is somewhat surprising that the extrapolated CCIR method seems fairly accurate for the Channel 7 paths but ridiculously low for the five UHF paths. The reason the predicted signal levels are low appears to be the high value used for the terrain irregularity parameter Δh, and clearly, since the direct ray passes well above most of the more rugged parts of the terrain, this irregularity should have little to do with the actual received levels. Indeed, a later version of this method (CCIR, 1982) has almost removed this parameter from consideration.

One expects a path in southern California to be involved in two or more propagation modes because there will be times when a strong super-refractive layer is present and times when it is not; and perhaps there will be times when such a layer lies above the path and times when it lies below. Each propagation mode will have its own statistics and the combination into one cumulative distribution ought to show up as somewhat segmented. Note that atmospheric layers will sometimes give rise to enhanced fields that should displace the small percentiles upward, and that also they may introduce radio holes and suppressed fields and so displace the large percentiles downward.

Mixed mode behavior seems consistent with several of the observed cumulative distributions. For example, the paths from KOCE (in Figures 26, 27, and 28) have distributions with definitely changing slopes. These are paths that we have already indicated were probably particularly sensitive to the presence of layers. The distribution in Figure 23 also seems to involve different modes of propagation. That in Figure 22, however, appears to be a pure straight line. But these two paths are physically almost identical, their only difference being a minor change in frequency. Why their signal-level distribution should be so qualitatively different is a puzzling question. Our own suspicion is that the answer lies merely in the difference between the hours of operation of the two stations.

Variability in the southern California paths can often be very large. The cumulative distributions of hourly medians sometimes have ranges of more than 70 dB. On the other hand, when we look at the eastern Colorado path in Figure 29, we find an extremely flat distribution with an interdecile range of only 6 dB. One probable reason for this is the thin atmosphere in Colorado; but another reason is perhaps that the odd terrain profile in Figure 15 causes the path to behave like a knife-edge path. It is known (see, e.g., Barsis and

Kirby, 1961) that such paths often exhibit a reduced variability. Of course, counterexamples also abound: the KOCE to Cowles Mountain path in Figures 13 and 27 is very clearly a knife-edge path but the observed signal-level distribution is certainly a steep one.

For some of our recently acquired data, the present radio propagation models seem already adequate; for others the differences are large but explainable. Yet others probably require further study. But to us it seems the difficult problem, and the problem needing immediate study, is that of predicting for a given path into which of these simple classifications it will fall--i.e., whether it will fit present models or will "need explanation."

4. ACKNOWLEDGMENTS

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