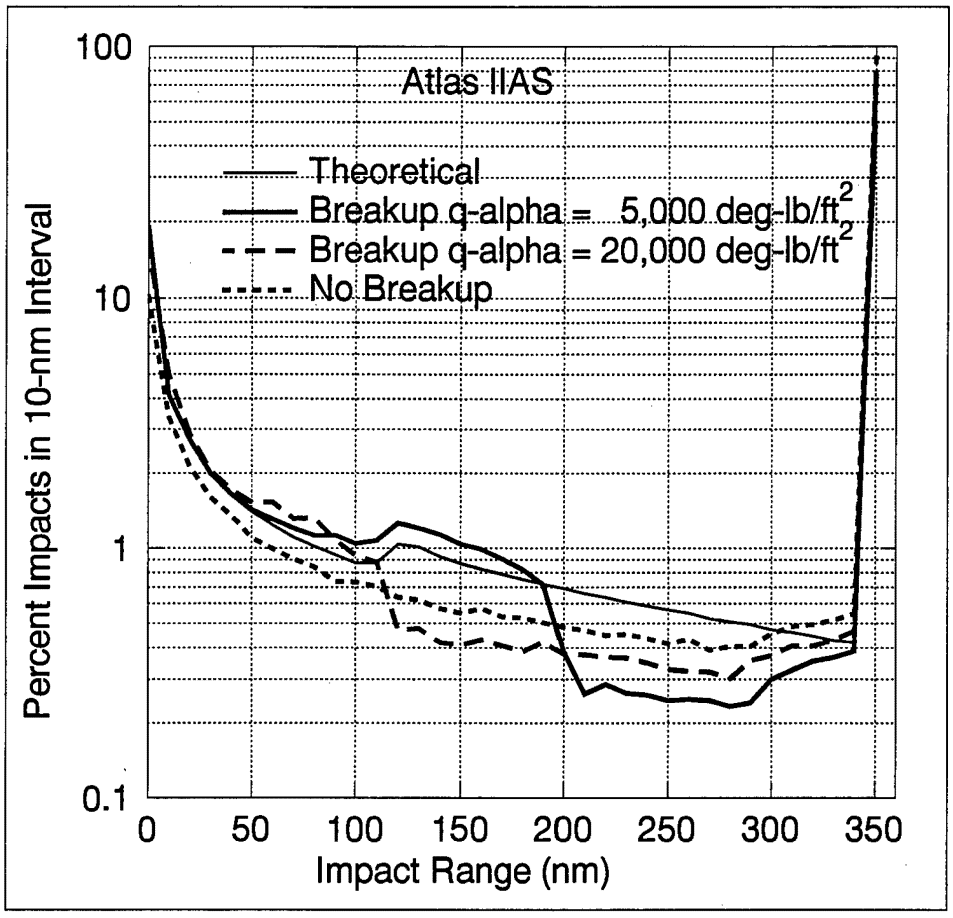

Figure 22. Impact-Range Distributions

Theoretical impact percentages for the same 10-mile range intervals were obtained by integrating the Mode-5 impact-density function [Eq. (3)] between the angle limits of zero and π, and between the range limits of R_1 and R_2, and doubling the results. The percentages are plotted in Figure 22. As pointed out in more detail at the end of Appendix B, the percentage of impacts in any range interval is independent of the values of A and B.

Figure 22 shows that the range impact distributions for theoretical Mode-5 impacts and random-attitude failures for breakup $q\alpha$'s between 5,000 and 20,000 deg-lb/ft^2 are in excellent agreement out to 50 miles. Theoretical percentages and random-attitude percentages for $q\alpha$ = 5,000 deg-lb/ft^2 (considered to be the most realistic value) are in good agreement out to 190 miles. Beyond that the differences appear fairly large, magnified as they are by the logarithmic scale, although the maximum absolute difference is only 0.4%. The steep rise in all curves at 350 miles is artificially created by lumping all impacts beyond 350 miles into one range interval instead of 10-mile intervals.