TIME-RESOLVED MW-MW STUDIES OF LOW TEMPERATURE NH_3 - He COLLISIONS

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We report preliminary results of low temperature (10 - 40 K) experimental studies of NH_3 in collisions with He using time-resolved MW - MW techniques. In these studies, ammonia is collisionally cooled in a low temperature cell filled with a background of helium. A short ($< 1\mu s$) pump pulse is used to excite a particular (*J, K*) inversion pair while a second weak source probes nearby inversion transitions. At these low temperatures, however, only a few rotational levels are populated, greatly simplifying the interpretation of the time-resolved data. In fact for para - NH_3 only the (1, 1) and (2, 2) levels will have significant population at 10 - 40 K. Adding in the inversion doublets, para - NH_3 is effectively a four-level system at these temperatures, making it in principle feasible to extract approximate state-to-state collision rates.