GAS PHASE SUBMILLIMETER WAVE SPECTROSCOPY IN A COLLISIONALLY COOLED CELL

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A collisional cooling cell operating down to 20K has been constructed at JPL. This cell is unique in two respects. First, a submillimeter wave source is employed which will allow new collision rates to be studied. Secondly, this cell has been designed specifically to look at the collisional cooling of water with various buffer gasses including hydrogen. This data will offer new insights into the interpretation of spectra of interstellar water.

We will present a summary of our progress to date. This includes an overview of our design, a detailed explanation of our experimental set up and an inspection of our results. We also present some preliminary pressure broadening studies of water done at a variety of temperatures (20K to 295K) using hydrogen, helium, nitrogen and oxygen. Finally, we present a description of where we would like to take this project in the future.