

## OBSERVATION OF SUPERRADIANCE IN MMWAVE SPECTROSCOPY OF RYDBERG STATES: BAD IS THE NEW GOOD

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The  $10^6$  increase in spectral velocity allowed by the combination of chirped pulse millimeter-wave spectroscopy with a buffer gas cooled molecular beam source qualitatively expands the classes of possible experiments. As an example, it allows for investigation of cooperative radiation effects (such as superradiance and subradiance) in large samples of atoms in Rydberg states in a single shot. However, these same effects can present obstacles to the application of the full increase in spectral velocity to high-resolution spectroscopic experiments through both frequency (chirps, broadenings, and shifts) and intensity effects.