Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

State resolved investigation of Förster resonant energy transfer in collisions between polar molecules and Rydberg atoms MARTIN ZEPPENFELD, FERDINAND JARISCH, Max Planck Institute of Quantum Optics — Investigation of collisions between molecules and Rydberg atoms provides access to a wide range of interesting processes, including, e.g., molecule-ion collisions, ionization, and electron capture. A particular fascinating aspect results from coincidences between the energy spacing of molecular rotational states and Rydberg states, leading to Förster resonant energy transfer between the two systems.
Combining state selective field ionization of Rydberg atoms with millimeter-wave state transfer allows us to perform fully state resolved measurements of Rydberg-atom populations. This allows us to investigate energy transfer between ammonia molecules and rubidium Rydberg atoms in detail [1]. Varying the Rydberg atom transition frequency by changing the initial Rydberg state and tuning the transition with electric fields allows us to investigate the depence of the resonant energy transfer on the resonance condition. Examining the populations of different Rydberg angular momentum states including different M-sublevels allows us to study angular momentum selection rules for the molecule-Rydberg-atom interactions.
[1] F. Jarisch *et al.* NJP **20**, 113044 (2018)

Martin Zeppenfeld
Max Planck Institute of Quantum Optics

Date submitted: 01 Feb 2019 Electronic form version 1.4