Abstract Submitted
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Molecular Resonances due to Long-Range Interactions between Ultracold Rydberg Atoms[1] D. TONG, S. M. FAROOQI, J. STANOJEVIC, R. CÔTÉ, E. EYLER, P. L. GOULD, University of Connecticut — Molecular resonances have previously been observed in the spectroscopy of cold dense Rydberg gases [1]. These are due to avoided crossings between interatomic potentials which originate at various doubly-excited asymptotes. In the vicinity of transitions to Rb np atomic Rydberg states ($n \sim$70), we have recently seen multiple molecular resonances which correspond to various pairs of highly-excited states. Examples of these combinations include (n-1)d+ns and (n-1)p+(n+1)p. We will report on measurements of these and other resonances as well as modeling of the spectra based on the long-range interatomic potentials and the strong couplings between them. [1] S.M. Farooqi, et al., Phys. Rev. Lett. **91**, 183002 (2003).

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Phillip Gould
University of Connecticut

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