

Abstract Submitted
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Rydberg polariton three-body interactions DALIA ORNELAS, ALEXANDER CRADDOCK, Univ of Maryland-College Park, MARY LYON, Stony Brook University, NATHAN FREDMAN, Univ of Maryland-College Park, MICHAEL GULLANS, Princeton University, STEVE ROLSTON, TREY PORTO, Univ of Maryland-College Park — The combination of atomic Rydberg interactions with electromagnetically induced transparency is a promising candidate for a wide range of applications for quantum optics, quantum information protocols and the study of many-body physics. These systems are a novel platform to study few-body physics where the dimensionality, mass, strength and sign of the interactions are all widely controllable and tunable, as has been demonstrated in recent experiments observing the formation of two and three-photon bound states. In this work, we present preliminary experimental results of an observed effect in a low-density Rydberg-EIT medium, where three-body loss is dominant over two-body loss, opening the door to do a more extensive study of few-body physics with Rydberg polaritons.

Dalia Ornelas
Univ of Maryland-College Park

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