Abstract Submitted
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Strong coherent coupling of many levels across the ionization limit via 17 and 36 GHz microwave fields[1] JOSHUA GURIAN, K. RICHARD OVERSTREET, University of Virginia, HARUKA MAEDA, PRESTO, Japan Science and Technology Agency, THOMAS GALLAGHER, University of Virginia — It has recently been proposed that microwave ionization of Rydberg atoms at frequencies above the classical Kepler frequency can be described by a dynamic Anderson localization model crossing over to a Fermi's Golden Rule approach at the photoionization limit. Here we present results that indicate 17 and 36 GHz microwave ionization is instead best described by a strong coherent electric dipole coupling of levels both above and below the ionization limit. Below the ionization limit, the requisite fields for 50% multiphoton ionization is similar to the single photon photoionization 50% threshold field. The coherent coupling of states continues smoothly across the ionization limit, manifesting itself in above threshold ionization. The above threshold microwave recombination to bound Rydberg states can be well described by a simple classical model.

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