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Spatial and Temporal Correlations in a Cold-Atom Rydberg-EIT System MICHAEL VIRAY, STEPHANIE MILLER, GEORG RAITHEL, University of Michigan — We investigate spatial and temporal second-order correlation functions, g$\hat{}$((2)) (r) and g$\hat{}$((2)) (τ), of cold rubidium-87 Rydberg atoms in a Rydberg-electromagnetically-induced-transparency (Rydberg-EIT) medium. To measure the spatial correlations, Rydberg atoms are field-ionized, and the resulting ion positions are recorded and processed to yield the spatial correlation function. For the temporal correlations in the Rydberg-EIT medium, the photon timing of the probe beam is recorded with a single photon counting module, and temporal correlations are extracted. We present preliminary results of these measurements and look at relations between the two correlation functions.

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