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Transient dynamics in Rydberg-EIT

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Ensembles of Rydberg atoms, in the Electromagnetic Induced Transparency setup, have proved to be a possible route to obtain photon-photon nonlinear interaction. Thanks to the Rydberg blockade mechanism, a single photon is indeed able to saturate the atomic response of a considerably large portion of the ensemble, that appears opaque to a second incoming one. While the continuous wave (CW) response of such a medium was largely studied in the past, here we present the analysis of the pulse dynamics. We show that the transient light can be more antibunched than the CW one, and how this could pave the way to the development of new protocols to turn light from classical into quantum.

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