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**Modeling Anomalous Broadening of Driven, Dissipative Rydberg Systems** JEREMY YOUNG, ELIZABETH GOLDSCHMIDT, THOMAS BOULIER, STEVE ROLSTON, TREY PORTO, Joint Quantum Institute, NIST/University of Maryland, ALEXEY GORSHKOV, Joint Quantum Institute and Joint Center for Quantum Information and Computer Science, NIST/University of Maryland — A crucial feature of many current theoretical proposals for driven, dissipative many-body Rydberg systems is the narrow linewidth of the Rydberg states. However, recently it has been observed that spontaneous transitions to nearby Rydberg states can result in observed linewidths orders of magnitude larger than the bare linewidth via dipole-dipole interactions. Here, we present our efforts at theoretically modeling the above experiment. We find good agreement with both the scaling behavior of the linewidth and the resonant pumping rate.

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