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**Dissipative phase transitions in anisotropic spin models** TONY LEE, ITAMP/Harvard, SARANG GOPALAKRISHNAN, MIKHAIL LUKIN, Harvard — We study anisotropic Heisenberg spin chains with dissipation similar to spontaneous emission. We examine the steady state due to the balance of coherent interaction and dissipation. As the XYZ components of the interaction change, the system undergoes a phase transition from a paramagnetic phase to a ferromagnetic or antiferromagnetic phase. We show that the ferromagnetic and antiferromagnetic phases exist only when the interaction is sufficiently anisotropic. We study quantum fluctuations (squeezing) and spatial correlations in the different phases of the system. Experimental implementations include trapped ions and atoms in optical lattices interacting via Rydberg blockade.

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