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Dynamical spectra of quantum strings in quantum spin ice WESLEY FUHRMAN, YUAN WAN, OLEG TCHERNYSHYOV, Johns Hopkins — String-like excitations in quantum spin-ice are a fascinating manifestation of quantum fluctuations and may be observable in materials such as $Yb_2Ti_2O_7$ and $Pr_2Zr_2O_7$. We study quantum spin-ice under external magnetic fields on both the checkerboard and pyrochlore lattice for experimentally relevant conditions. We show that excitations in quantum spin ice may be string-like, and that stronger quantum fluctuations reduce string tension and lead to deconfined monopoles. Additionally, we discuss the crossover from strings to magnons in the high-field regime. We provide predictions for observing strings via inelastic neutron scattering and THz spectroscopy.

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