Abstract Submitted
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**Dynamics of quantum excitations in square ice**[1] CLAUDIO CASTELNOVO, TCM group, Cavendish Laboratory, University of Cambridge, Cambridge CB3 0HE, UK, STEFANOS KOURTIS, Department of Physics, Princeton University, Princeton, NJ 08544, USA — The study of emergent excitations in classical spin ice has culminated in the discovery of a condensed-matter realization of magnetic monopoles. In spin-ice materials where quantum fluctuations play an important role, excitations acquire quantum properties that promote them to more complicated and exciting objects. To understand these quantum excitations better in a relatively simple context, we construct a toy model of excited square ice and solve it both exactly by tuning it to a Rokhsar-Kivelson point and numerically for small clusters. We furthermore numerically evaluate the dynamic spin structure factor and compare it to effective free-particle theories. Our results offer a useful point of comparison for further theoretical and experimental work.

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