

Abstract Submitted
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Magnetism of a Frustrated Four-Spin-Tube¹ WOLFRAM BRENIG, Technical University Braunschweig, Germany, MARCELO ARLEGO, Universidad Nacional de La Plata, Argentina — We report on the magnetism of a frustrated four-leg spin-1/2 tube (FFST) [1]. Using a combination of series expansion, based on the continuous unitary transformation method and density-matrix renormalization group we analyze the ground-state correlations, and the one-, and the two-particle excitations in the regime of strong rung-coupling. We find that frustration destabilizes the spin-gapped quadrumer singlet-phase of the FFST, leading to first order quantum phase transitions. Apart from the well-know triplon branch of two-leg spin-ladders, the FFST is shown to sustain additional elementary excitations, including a singlon, and additional triplons. Finally, in the two-particle sector the FFST exhibits several collective (anti)bound states. Frustration has significant impact on the FFST leading to a flattening of the ground-state energy landscape, a mass-enhancement of the excitations, and a relative enhancement of the (anti)binding strength.

[1] Marcelo Arlego and Wolfram Brenig Phys. Rev. B **84**, 134426 (2011).

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Wolfram Brenig
Technical University Braunschweig

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