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Title:	Cluster mean-field study of the Heisenberg model for CuInVO
Authors:	Singhania, A. (/jspui/browse?type=author&value=Singhania%2C+A.) Kumar, Sanjeev (/jspui/browse?type=author&value=Kumar%2C+Sanjeev)
Keywords:	Antiferromagnet Condensation (Phase Transition) Quantum Spin System
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Abstract:	Motivated by the experimental report of unusual low-temperature magnetism in the quasi-one-dimensional magnet CuInVO ₅ , we present results of a cluster mean-field study on a spin-1/2 Heisenberg model with alternating ferromagnetic and antiferromagnetic nearest-neighbor coupling. We map out the ground-state phase diagrams with varying model parameters, including the effect of an external magnetic field. An unexpected competition between different spin-spin correlations is uncovered. Multiple spin-flop transitions are identified with the help of component-resolved correlation functions. For the material-specific choice of model parameters we discuss the temperature dependence of specific heat and magnetic susceptibility and compare our results with the available experimental data. A detailed account of spin-spin correlations allows us to present a microscopic understanding of the low-temperature magnetic ordering in CuInVO ₅ . Most notably, we identify the origin of an extra peak in the low-temperature specific heat data of CuInVO ₅ reported by Hase et al. [Phys. Rev. B 94, 174421 (2016)].
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