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A quasi-1d approach to the triangular antiferromagnet Cs_2CuCl_4
LEON BALENTS, Physics Department, UCSB , OLEG STARYKH, Physics Department, University of Utah — We discuss the low-temperature properties of a spin-1/2 triangular Heisenberg antiferromagnet in a field, including the effects of Dyaloshinskii-Moriya interactions, as believed appropriate to Cs_2CuCl_4[1]. Our treatment is based upon a view of the problem as a system of weakly-coupled spin chains. Analytic results are obtained through a combination of renormalization group, chain mean-field, and bosonization methods. Using various exactly-known properties of the individual Heisenberg chains, we calculate numerous physical properties, including various phase boundaries in longitudinal and transverse fields. We compare our results to published experimental data.

[1]R. Coldea et al., Phys. Rev. Lett. 88, 137203 (2002).

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