

Abstract Submitted
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Magnetic phase diagram of the $S=1/2$ triangular-lattice antiferromagnet $\text{Ba}_3\text{CoSb}_2\text{O}_9$ ¹ YOSHITOMO KAMIYA, RIKEN, CRISTIAN BATISTA, Los Alamos National Laboratory — To explain the recently reported magnetic phase diagram of the spin-1/2 triangular-lattice compound $\text{Ba}_3\text{CoSb}_2\text{O}_9$ [1-3], we present a semiclassical mean-field theory for the easy-plane XXZ model on the stacked triangular-lattice with a small inter-layer coupling. Quantum effects are incorporated by deriving effective interactions from the linear spin-wave analysis of the two-dimensional model. This analysis reproduces the main experimental observations, such as the 1/3-magnetization plateau ($B \parallel a$), a cusp near 1/3 of the saturated moment ($B \parallel c$), and a small step anomaly in the high field regime. The predicted spin configurations are compared against the NMR measurements on this compound. This work was done in collaboration with G. Koutroulakis (Los Alamos), T. Zhou (UCLA), J. D. Thompson (Los Alamos), H. D. Zhou (Univ. of Tennessee), and S. E. Brown (UCLA).

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