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Simulation of the triangular Kondo-lattice model using the gradient kernel polynomial method KIPTON BARROS, YASUYUKI KATO, Theoretical Division, Los Alamos National Laboratory — We introduce a method to study systems, such as the Kondo-lattice model, where a classical field is coupled to fermionic degrees of freedom. Such systems are computationally challenging because each change to the classical field requires recalculation of the density of states for the bilinear fermionic Hamiltonian. The kernel polynomial method (KPM) is a useful tool to approximate the density of states at a cost linear in the system size. We extend KPM to approximate the gradient of the density of states at the same cost, allowing fast updates of the entire classical field. Simulations of the triangular Kondo-lattice model indicate phases with exotic non-coplanar spin ordering and spontaneous quantum Hall effect.

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