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Loop-liquid State in an Ising-spin Kondo Lattice Model on a Kagome Lattice YUKITOSHI MOTOME, Univ. Tokyo, HIROAKI ISHIZUKA, KITP UCSB, Univ Tokyo — Emergence of paramagnetic states with strong local correlations is one of the characteristic features of geometrically frustrated magnets. One such example is the spin-ice compounds, where all the tetrahedra favor two-in two-out spin configurations, and the “in” and “out” spins individually form loop-like structures on the pyrochlore lattice. When such a locally-correlated spin state is coupled to itinerant electrons, recent theoretical studies have shown that it considerably affects the electronic state of coupled electrons. While several studies have been done, possible realization and stability of such a correlated-disorder state remains to be studied. To address these issues in the presence of spin-charge coupling, we here study an Ising-spin Kondo lattice model on a kagome lattice [1]. By using a Monte Carlo simulation, we show that a locally-correlated state with all the triangles being in up-up-down spin configurations spontaneously emerges in this model. We also show that the peculiar state considerably affects the electronic state, giving rise to a resonant peak in the optical conductivity. [1] H. Ishizuka and Y. Motome, PRB 88 081105 (2013).

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