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Spin scalar chiral ordering and hidden positive biquadratic interaction in frustrated Kondo lattice systems YUTAKA AKAGI, Dept. of Appl. Phys., Univ. of Tokyo, MASAFUMI UDAGAWA, Dept. of Appl. Phys., Univ. of Tokyo, MPI PKS, YUKITOSHI MOTOME, Dept. of Appl. Phys., Univ. of Tokyo — Recently, noncoplanar spin configurations with spin scalar chirality have drawn considerable attention as an origin of the anomalous Hall effect. In this mechanism, itinerant electrons acquire an internal magnetic field according to the solid angle spanning three spins through the so-called Berry phase, which can result in the anomalous Hall effect. In order to explore such nontrivial magnetic states in spin-charge coupled systems, we investigate a ferromagnetic Kondo lattice model on a triangular lattice by variational and perturbative calculations. As a result, we find that a noncoplanar four-sublattice spin ordering emerges near 1/4 filling, in addition to the 3/4 filling reported in the previous study. This new phase is stabilized in a wider parameter region compared to the 3/4 filling phase [1]. We also find that a kinetic-driven positive biqaudratic interaction is critically enhanced and plays a crucial role on stabilizing a spin scalar chiral ordering near 1/4 filling. The origin of large positive biquadratic interaction is ascribed to the Fermi surface connection by the four sublattice ordering wave vectors, which we call the higher-order Kohn anomaly [2]. [1] Y. Akagi and Y. Motome, J. Phys. Soc. Jpn. 79 (2010) 083711. [2] Y. Akagi, M. Udagawa, and Y. Motome, submitted.

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