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Weyl-Kondo semimetals in a non-centrosymmetric three-dimensional lattice SARAH ELAINE GREFE, HSIN-HUA LAI, Department of Physics Astronomy, Rice University, Houston, Texas 77005, USA, SILKE PASCHEN, Institute of Solid State Physics, Vienna University of Technology, Wiedner Hauptstraße 8-10, 1040 Vienna, Austria, QIMIAO SI, Department of Physics Astronomy, Rice University, Houston, Texas 77005, USA — The spin-orbit coupling and electron correlations of heavy fermion systems make them a rich playground for a variety of quantum phases, including those with topological characteristics. Motivated by the recent finding of a Dirac-Kondo semimetal phase in a two-dimensional model [1], we study the Anderson lattice model in an inversion-symmetry-breaking lattice in three dimensions. Both the weak coupling and strong coupling limits are analyzed. In both parameter regimes, we identify a Weyl-Kondo semimetal (WKSM) phase. In the strong coupling regime, the quasiparticles near the Weyl nodes have velocities that are strongly reduced by the interaction effects, corresponding to a narrow band, which will make them readily amenable to studies by thermodynamic and thermoelectric means. We also determine the surface states of the WKSM phase, and demonstrate how they manifest the correlation effects. [1] X.-Y. Feng, H. Zhong, J. Dai, Q. Si, "Dirac-Kondo semimetals and topological Kondo insulators in the dilute carrier limit," arXiv:1605.02380

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