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Unusual phase boundary and altered Fermi surface in $CeOs_4Sb_{12}$ at high magnetic fields[1] PEI-CHUN HO, CSU-Fresno, JOHN SINGLETON, NHMFL/LANL, PAUL A. GODDARD, U of Warwick, UK, FEDOR F. BALAKIREV, SHALINEE CHIKARA, NHMFL/LANL, M. BRIAN MAPLE, UC San Diego, TATSUYA YANAGISAWA, Hokkaido U, Jpn — The filled skutterudite compounds $CeOs_4Sb_{12}$ is a 1K antiferromagnetic (AFM) semimetal and candidate topological insulator. Using magnetization (M), MHz-conductivity and electrical resistivity (ρ) data recorded at magnetic fields of up to $\mu_0 H = 60$ T and temperature T down to 0.4 K, we map out the (H,T) phase diagram. At low T and low H (L phase), the Ce $4f$ electron is delocalized, yielding heavy quasiparticles with a small Fermi surface, while at high T and high H (H phase) the $4f$ electron is quasi-localized, leaving a single, almost spherical Fermi surface of light-mass holes. The behavior of ρ and dM/dH on crossing the L-H boundary, plus comparisons with bandstructure calculations, suggest that the L-H phase transition in $CeOs_4Sb_{12}$ is similar in origin to the $\alpha - \gamma$ transition in Ce and its alloys. However, interplay between the free-energy contributions of the AFM and L phases results in a very unusual curvature of the phase boundary at low T.

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