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High-field de Haas-van Alphen investigation of the filled skutterudite compound $\text{NdOs}_4\text{Sb}_{12}$ ¹ P.-C. HO, Physics/CSU-Fresno, J. SINGLETON, NHMHL/LANL, M.B. MAPLE, Physics/UCSD, P. GODDARD, Physics/Oxford U., T. YANAGISAWA, Niiigata U., Japan — The filled skutterudite compound $\text{NdOs}_4\text{Sb}_{12}$ displays mean-field type ferromagnetism with a Curie temperature of 0.9 K. The apparent electronic specific heat coefficient $\gamma \sim 0.52 \text{ Jmol}^{-1}\text{K}^{-2}$ is very large. In order to search for possible heavy-fermion behavior, de Haas-van Alphen (dHvA) measurements were performed on $\text{NdOs}_4\text{Sb}_{12}$. Experiments for $\text{H} // [100]$ show dHvA frequencies at 695 ± 10 , 950 ± 10 , and 2560 ± 20 T with effective masses ranging from 1.8 to $2.9 m_e$. Moreover, the angle dependence of dHvA frequencies is very similar to that of $\text{LaOs}_4\text{Sb}_{12}$. Both results suggests that heavy-fermion behavior is not primary responsible for the large γ . In this context, a theoretical model by Miyake et al. indicates that the tunneling motion of the rare earth ions between off-center sites may enhance the interaction between local phonons and neighboring conduction electrons in the filled skutterudites, resulting in a large γ . This may be relevant to the extra mode found at 15 K in ultrasound measurements on $\text{NdOs}_4\text{Sb}_{12}$, implying abnormal behavior of the phonon spectrum in this compound.

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