Abstract Submitted
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Quantum oscillations and low-T resistivity of the 5s delafossite $PdCoO_2$[1] CLIFFORD HICKS, ALEXANDRA GIBBS, ANDREW MACKENZIE, University of St Andrews, U.K., HIROSHI TAKATSU, Tokyo Metropolitan University, Japan, YOSHITERU MAENO, Kyoto University, Japan, EDWARD YELLAND, University of St Andrews, U.K. — We report dHvA torque and resistivity data on the highly conductive delafossite $PdCoO_2$. Quantum oscillations confirm electronic structure calculations in showing a single, highly 2D Fermi surface with almost exactly half filling. However the cyclotron masses and the details of the warping are consistent with $PdCoO_2$ being a 5s metal, rather than the 4d metal indicated in most electronic structure papers. The room temperature resistivity is $\rho_{ab} = 2.6 \pm 0.2$ $\mu\Omega$-cm, lower than all elemental metals apart from the noble metals. The low-T residual resistivity of our samples is 0.008 $\mu\Omega$-cm, corresponding to an extremely long mean free path of 20 μm, surprising for a flux-grown material. The temperature dependence of the electron-phonon contribution to the resistivity is exponential rather than T^5, indicating phonon drag, and the only observation of phonon drag in resistivity outside the alkali metals.

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