Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Fermi Surface of the Pnictide Superconductor $LaRu_2P_2$ studied by quantum oscillations PHILIP MOLL, Solid State Physics, ETH Zurich, FEDOR BALAKIREV, ROSS MCDONALD, NHMFL, LANL, Los Alamos, NM, JANUSZ KARPINSKI, ZBIGNIEW BUKOWSKI, Solid State Physics, ETH Zurich, PETER BLAHA, KARLHEINZ SCHWARZ, Computational Quantum Chemistry Group, TU Vienna, BERTRAM BATLOGG, Solid State Physics, ETH Zurich — $LaRu_2P_2$ is a stochiometric pnictide superconductor ($T_c \sim 4.1$K) and crystallizes in the $ThCr_2Si_2$ structure (the "122" pnictide family). We have mapped out its Fermi surface via the deHaas-vanAlphen effect in pulsed magnetic fields up to 60T (LANL/NHMFL). Pronounced oscillations were observed in the magnetic torque measured with a microcantilever setup. Two features are particularly noteworthy: The oscillations can be followed to surprisingly high temperatures beyond 20K, and the main frequency component at $\theta = 20^\circ$ ($\theta = 0^\circ$ at HIIc) is at 349T (α-peak), significantly lower than in the related compounds $LaFe_2P_2$. A second frequency originating from a larger Fermi surface cross-section at 1921 T (β-peak) is identified. The temperature dependence of the amplitudes is well described by the Lifshitz- Kosevich formalism and gives low effective masses $m^*/m = 0.80$ (α sheet) and 1.09 (β sheet). Therefore, most "122" metals appear to have similarly low effective masses.

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Date submitted: 07 Dec 2010 Electronic form version 1.4