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de Haas-van Alphen studies of electron doped Sr_2RuO_4 PETER D.A. MANN, CHRISTOPH BERGEMANN, University of Cambridge, NAOKI KIKUGAWA, University of St. Andrews, STEPHEN R. JULIAN, University of Toronto, ANDREW P. MACKENZIE, University of St. Andrews, YOSHITERU MAENO, Kyoto University, UNIVERSITY OF CAMBRIDGE TEAM, UNIVERSITY OF ST. ANDREWS TEAM, KYOTO UNIVERSITY TEAM, UNIVERSITY OF TORONTO TEAM — We present the results of a highly sensitive de Haas-van Alphen (dHvA) rotation study of $La_xSr_{2-x}RuO_4$, for $x = 0.02$, 0.06 and 0.10. By substituting Sr^{2+} with La^{3+}, we are effectively doping the unconventional superconductor Sr_2RuO_4 with electrons without gross distortions to the crystal structure. According to band structure calculations, the resultant rigid band shift should push the Fermi level towards a van Hove singularity at $x = 0.20$, which has important consequences for theories of spin-fluctuation mediated superconductivity. In this study, due to extremely high quality samples and a low noise experimental set-up, we have been able to extract information about changes in the Fermi surface warping, electronic effective masses and spin susceptibility up to $x = 0.10$. The experimental runs were carried out in fields up to 18 T, and the samples were rotated in the [001] to [100] plane. We have determined the field-dependent dHvA amplitude and compared it with numerically calculated results from a model Fermi surface. Effective masses were calculated from the temperature dependence of the oscillation amplitudes.

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