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Optical spectroscopic analysis of Sr_2RhO_4 and comparison with Sr_2RuO_4[1] KIM MORTIMER, NATHAN ARMSTRONG, JESSE HALL, THOMAS TIMUSK, McMaster Univ — Sr_2RhO_4 is a strongly correlated electron oxide, similar to the unconventional superconductor Sr_2RuO_4. Changing Ru to Rh destroys superconductivity and skews the crystal structure without eliminating T^2 resistivity [1,2]. Using optical floating zone furnace techniques we grew single crystals of Sr_2RhO_4. We then performed spectroscopic measurements of the material at frequencies ranging from 4 meV to 1.2 eV and temperatures from 12 K to 300 K. We compare these results with those from single crystals of Sr_2RuO_4, grown by the author at Kyoto University and displaying <10% 3K phase, which were measured concurrently with Sr_2RhO_4 on the same apparatus. The optical resistivity $\rho(\omega, T)$ of both of these materials are then compared to the predictions of Landau-Fermi liquid theory – in particular, the ratio between the temperature dependence and frequency dependence of resistivity, which yields insight into electron scattering mechanisms. [3] 1. Hase & Nishihara, doi: 10.1143/JPSJ.65.3957 2. Nagai et al, doi: 10.1143/JPSJ.79.114719 3. Maslov & Chubukov, doi: 10.1103/PhysRevB.86.155137

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