HG 2 Electronic Structure of Nb_3Sb. G. W. CRABTREE and A. J. ARKO, Argonne National Laboratory and Z. FISK, University of California at San Diego -- We present extensive de Haas-van Alphen data on the Fermi surface geometry and cyclotron effective masses in Nb_3Sb, a low T_c superconductor whose lattice constant and electronic structure are typical of the high T_c A15 compounds. Data taken in fields to 80 kG and temperatures to 0.4 K show many incomplete frequency branches near the symmetry directions, suggesting considerable magnetic breakdown. The observed Fermi surface consists of closed sheets centered at the M and R points in the Brillouin zone, in qualitative agreement with first principles band calculations on Nb_3Sb and with rigid band shifts of Nb_3Sn calculations. However, detailed comparison of our data with theory[1] shows that the structure at the M point can only be explained by allowing a non-spherical potential about the Nb sites. This emphasizes the importance of non-spherical corrections due to the chainlike structure of the transition metal atoms in A15 materials.

[1]A. T. van Kessel, et. al., Conference on Superconductivity in d- and f-Band Metals, La Jolla, California, June 21-23, 1979.