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Collective excitations in thin ^{3}He films DAVID LI, ROGER ANDERSON, MICHAEL MILLER, Washington State University — The spectra for (longitudinal) collective excitations in thin polarized ^{3}He films are calculated from Fermi liquid theory. The calculation uses state-dependent Landau parameters that have been computed to quadratic order in s-wave and p-wave effective interaction components. The interaction components have been determined from existing spin susceptibility and specific heat measurements for ^{3}He adsorbed on graphite substrates and also in thin ^{3}He - superfluid ^{4}He films. The zero sound and spin-zero sound spectra as a function of density and polarization are obtained by solving Landau's kinetic equation. The matrix elements are computed exactly and analytically. The solutions contain partial wave contributions up to the $\ell = 3$ angular momentum components. In particular, we study features in the oscillation amplitudes of the two Fermi surfaces at finite polarization. We note that at this time there have been no direct measurements of sound speeds in ^{3}He films and so all of these results constitute predictions.

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