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Transport in highly spin-polarized normal liquid 3He

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Normal liquid Helium 3 is an ideal system to study the role of correlations in fermions physics. It is characterized by strong interactions between particles, the range of which is comparable to the inter-atomic distance. As such, it represents an intermediate case of complexity, halfway between the electronic systems and the ultra-cold Fermi gases. In particular, transport in degenerate Helium 3 involves not only s-wave scattering, but also partial waves with non-zero orbital angular momentum. Studying the polarization dependence of transport allows to directly probe this fact. We will report on transport experiments in highly spin-polarized, degenerate, liquid 3He, obtained by melting spin polarized solid 3He and rapidly cooling the resulting liquid down to about 60 mK. While the polarization dependence of viscosity is unexpectedly close to that predicted for a free fermion gas, the thermal conductivity increases much less with polarization than expected in that case. We will discuss the possible reasons for this difference.