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Transport in magnetized dense plasmas for magneto-inertial fusion XIANZHU TANG, Los Alamos National Laboratory — Transport in high energy density plasmas embedded in an ultra-high magnetic field with closed magnetic fields or magnetic surfaces is of importance to the magneto-inertial fusion (MIF) in the high energy density laboratory plasmas (HEDLP) program. The energy loss rate by thermal transport and radiation in the magnetized dense plasma of the MIF target determines both the feasibility of the concept (i.e. can the target achieve ignition temperature, ~ 10 keV for D-T?) and the efficiency of the scheme (i.e. how much driver power and energy are needed?). A three year LDRD project has been funded at LANL to investigate this physics. Specifically we will assess the transport in dense (and high energy density) plasmas for three plasma target options, namely the field reversed configuration (FRC), the spheromak, and the spherical tokamak with a plasma center column (ST-PCC). As a first step, the neoclassical transport in the collisional and weakly collisional regime of the high energy density target plasmas will be investigated. Work supported by LANL LDRD.

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