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3D Gyrokinetic Simulation of Heat Transport in a Magnetized Ring-Shaped Temperature Filament[1] R. SYDORA, University of Alberta, Canada, B. VAN COMPERNOLLE, G.J. MORALES, J.E. MAGGS, UCLA — 3D electromagnetic gyrokinetic particle simulations of drift-Alfven fluctuations and thermal transport have been carried out using plasma conditions similar to those in the recent off-axis heat source experiment performed in the Large Plasma Device (LAPD) at UCLA. The novel heat source resulted in a long, hollow cylindrical temperature filament of elevated electron temperature(Te) embedded in a colder plasma. The drift wave fluctuations and thermal transport and profiles have been characterized experimentally. The gyrokinetic simulations (cylindrical geometry) are initialized using experimental parameters including the radial and axial extent of the hollow cylindrical Te-filament. The inner ring diameter is taken to be approximately four times its width. The Te gradient is mainly determined by the ratio of the peak temperature in the ring to the background temperature and above a certain gradient threshold, drift-Alfven fluctuations were excited and induced a rapid thermal collapse on time scales consistent with experiment. The spatio-temporal pattern of the electrostatic potential, density, and magnetic fluctuations have been analyzed in the linear and nonlinear, saturated state of evolution. Detailed comparisons with experiment are presented.

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