Abstract Submitted
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Effect of neutral interactions in gyrokinetic simulations of single seeded blobs[1] EMILY HUMBLE, University of Houston, TESS BERNARD, Oak Ridge Associated Universities, FEDERICO HALPERN, General Atomics - San Diego, RUPAK MUKHERJEE, Princeton Plasma Physics Laboratory, GREGORY HAMMETT, Princeton University, MANAURE FRANCISQUEZ, Princeton Plasma Physics Laboratory, NOAH MANDELL, MIT, AMMAR HAKIM, Princeton Plasma Physics Laboratory — We have studied the effect of neutral interactions on seeded blob dynamics using the continuum gyrokinetic code Gkeyll. Blobs, coherent structures of enhanced pressure, arise in the scrape-off layer (SOL) of fusion devices due to the interchange instability. They are convected radially outward by an ExB force, occurring from charge polarization due to magnetic drifts. Understanding blob transport is important due to its effect on exhaust properties in the SOL. The magnitude of the ExB force and resulting acceleration depends on the various currents that can dampen the charge accumulation, including current due to inelastic neutral collisions. A kinetic model for neutral dynamics has been coupled to the gyrokinetic solver in Gkeyll and includes electron-impact ionization, charge exchange and wall recycling. In seeded blob simulations, scans were conducted in blob size, background density and temperature, and blob density and temperature, both without and with neutral interactions. Velocities of the blobs were measured and compared to predicted scalings. Blob compactness and thermal and kinetic energy was also studied.

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Emily Humble
University of Houston

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