

Abstract Submitted
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Turbulent Transport of Fast Ions in the Large Plasma Device (LAPD)¹ SHU ZHOU, WILLIAM HEIDBRINK, ROGER MCWILLIAMS, HEINRICH BOEHMER, University of California, Irvine, TROY CARTER, PAVEL POPOVICH, SHREEKRISHNA TRIPATHI, STEVE VINCENA, University of California, Los Angeles, FRANK JENKO, Max-Planck-Institut für Plasmaphysik — Due to gyroradius averaging and drift-orbit averaging, the transport of fast ions by microturbulence is often smaller than for thermal ions. In this experiment, Strong drift wave turbulence is observed in LAPD on gradients produced by a plate obstacle. Energetic lithium ions orbit through the turbulent region. Scans with a collimated analyzer and with probes give detailed profiles of the fast ion spatial distribution and of the fluctuating fields. The fast-ion transport decreases rapidly with increasing fast-ion gyroradius. Unlike the diffusive transport caused by Coulomb collisions, in this case the turbulent transport is non-diffusive. Analysis and simulation suggest that the fast ions interact ballistically with stationary two-dimensional electrostatic turbulence. The energy dependence of the transport is well explained by gyro-averaging theory. In new experiments, different sources and obstacles alter the drift-wave turbulence to modify the nature of the transport.

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