

Abstract Submitted
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Diffusive-convective transition for scrape-off layer transport¹ J.R. MYRA, D.A. RUSSELL, D.A. D'IPPOLITO, Lodestar Research Corp. — Transport of plasma from the edge pedestal gradient region into the scrape-off layer (SOL) impacts the SOL width, critical for future tokamak devices. This width is believed to be set by a competition between classical parallel transport and turbulent cross-field transport. In previous work, [J.R. Myra et al, submitted to J. Nucl. Mater. (2010)] focusing on modeling of the heat flux width in NSTX experiments, the possibility of a transition from quasi-diffusive to convective transport in the SOL was noticed. This transition is explored here theoretically and through SOL turbulence simulations using the SOLT code [D. A. Russell, et al, Phys. Plasmas 16, 122304 (2009)]. At the transition, the transport becomes intermittent, and the SOL width is broadened due to blob emission. Critical dimensionless parameters for the transition are investigated. The inputs to the model include the net heat flux into the SOL and the parallel particle and energy confinement times, which are related to the connection length and plasma collisionality.

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