Abstract Submitted
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Model for transport driven by microtearing modes in tokamak discharges[1] T. RAFIQ, A.H. KRITZ, Lehigh University, J. WEILAND, Chalmers University, A.Y. PANKIN, Tech-X Corporation, L. LUO, NC State University — Microtearing modes (MTMs) have been identified as a source of significant electron thermal transport in high beta tokamak discharges. A model for MTMs that can be installed in integrated predictive modeling codes is needed in order to improve the prediction of electron thermal transport and, consequently, the prediction of the evolution of the plasma in devices in which MTMs have a significant role. A unified fluid/kinetic approach is used in the development of a model for the transport driven by MTMs. The derivation includes the effects of electrostatic and magnetic fluctuations, collisionality, electron and ion temperature and density gradients and arbitrary curvature. MTMs are short-wavelength, ion scale electromagnetic instabilities which are driven by the electron temperature gradient in collisional plasma and propagate in the electron diamagnetic direction. The frequency of these modes is generally greater than the electron diamagnetic drift frequency, and the mode structure is extended along the magnetic field lines.

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Tariq Rafiq
Lehigh University

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