



Contribution ID: 60

Type: Poster

TH/P7-01: Particle Transport in Ion and Electron Scale Turbulence

Friday, October 12, 2012 8:30 AM (4 hours)

In the present work the turbulent transport of main ions and impurities in tokamaks, driven by ion scale ITG/TE modes and electron scale ETG modes, is studied. Nonlinear and quasi-linear gyrokinetic simulation results obtained with the code GENE are compared with results from a computationally efficient fluid model. In particular, the transport of particles in regions of steep density gradients, relevant to the pedestal region of H-mode plasmas, is investigated.

The main focus of the work is to obtain steady state particle profiles locally, determined from the balance between diffusive and convective fluxes in source-free regions. The sign of the convective particle velocity (pinch) and the particle density peaking, measured by the density gradient (R/L_n) for zero particle flux, is calculated. For ITG/TE mode turbulence, scalings are obtained for the particle peaking with the driving density and temperature gradients and the impurity charge number. The crucial question of helium ash removal is also investigated. For ETG mode turbulence, the main ion density gradient corresponding to zero particle flux, relevant to the formation and sustaining of the steep edge pedestal, is estimated.

Country or International Organization of Primary Author

SWEDEN

Primary author: Mr SKYMAN, Andreas (Chalmers University of Technology)

Co-authors: Prof. NORDMAN, Hans (Chalmers University of Technology, SWEDEN); Dr ANDERSON, Johan (Chalmers University of Technology, SWEDEN); Mr STRAND, Par (Sweden); Dr SINGH, Raghvendra (Institute for Plasma Research, Bhat, India)

Presenter: Mr STRAND, Par (Sweden)

Session Classification: Poster: P7

Track Classification: THC - Magnetic Confinement Theory and Modelling: Confinement