

## **Fluid features of the stochastic layer transport in LHD**

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Associated with the large shear, the rotational transform in the edge region of the LHD helical divertor configurations covers countless resonances which overlap on each other, forming a stochastic layer of a ~10-sentimeter thickness surrounding the confinement core region. Although strong ergodicity is usually indicated by Poincaré -plots, clear island contours of low-order resonances emerge in the fluid pictures of the EMC3/EIRENE calculations, showing that the basic plasmas transport properties in the stochastic layer are governed by low-order magnetic islands.

Using the EMC3/EIRENE code, the paper presents a numerical analysis of plasma and impurity transport behaviors in the low-order island chains of various mode numbers. Topics addressed and discussed will be island flattening effects, flow patterns and flow damping, recycling flux suppression, rollover of divertor flux, impurity retention, detachment and Marfe formation and dynamics. Comparisons with experimental results will also be presented.