Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Numerical modelling of a minimal transport model in tokamak edge plasma ERIC SERRE, CNRS, LIVIA ISOARDI, Aix-Marseille Université, GUIDO CIRAOLO, GUILLAUME CHIAVASSA, Ecole Centrale Marseille, PIERRE HALDENWANG, Aix-Marseille Université, FRÉDÉRIC SCHWANDER, PHILIPPE GHENDRIH, YANICK SARAZIN, IRFM/CEA Cadarache, PATRICK TAMAIN, EURATOM / UKAEA , M2P2 UMR 6181 CNRS TEAM, IRFM/ CEA CADARACHE TEAM, EURATOM / UKAEA TEAM — Plasma flows at the transition between the core and the scrape off layer (SOL) of tokamaks play a crucial role in determining the confinement properties of the plasma. The spreading of SOL flow patterns into the edge plasma is investigated numerically in geometry relevant to limiter plasma, using a model in which the coupling between parallel momentum and plasma density is considered. The flow pattern is mainly governed by the density diffusion. It can either exhibit sharp radial gradients at the interface, or spread from the SOL into the edge plasma, depending on the effective diffusion coefficient. Parallel flows with non-zero velocity, resulting from spreading of parallel momentum into the core, are also readily observed in the edge around the limiter. Such features are important to understand the edge/SOL interplay, and model 3D effects including Kelvin Helmholtz instabilities that may be triggered by the strong radial shear on parallel velocity in the transition region. 3D computations taking into account the dynamics in the poloidal direction are already in progress.

Eric Serre
CNRS

Date submitted: 31 Jul 2008 Electronic form version 1.4