Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

3D Boundary Behavior in RFX-mod: Role of Advected Quantities P. SCARIN, M. AGOSTINI, L. CARRARO, G. CIACCIO, G. SPIZZO, N. VIANELLO, Consorzio RFX, Padova, Italy — The boundary of the RFX-mod Reversed Field Pinch device is characterized by weak magnetic chaos affecting ion and electron diffusion. Particle transport is determined by magnetic islands and by the electrostatic potential which arises from the interaction of the ambipolar constraint on electron-ion motion, with plasma-wall interaction (PWI). We will present an extensive summary of experimental observations, indicating that plasma pressure, floating potential, particle influx, plasma flow (or equivalently, radial electric field E^r) and turbulence structures are modulated according to the the MHD modes (m/n=0/1 and 1/7) that determine the geometry of the edge. The distortions ("ripple") of magnetic flux surfaces, along the toroidal and poloidal directions, are due to the presence of magnetic islands, whose X-points in the RFP are characterized by a negative charge excess (electron accumulation). Apparently, RMPs in Tokamaks are characterized by electron accumulation near the O-points of those islands, due to a different level of magnetic chaos. The presence of an E^r modulation along the angles, makes the edge plasma sensitive to advected quantities through particle energy, energy-exchanging collisions and particle recycling at the wall. We will also explore the feedback of the change of turbulence properties on MHD, by analyzing the dependence of the 0/1 mode amplitude on the Prandtl number.

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Date submitted: 10 Jul 2013 Electronic form version 1.4