Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Poloidal structure of the plasma edge with 3D magnetic fields MATTEO AGOSTINI, PAOLO SCARIN, LORELLA CARRARO, GIANLUCA SPIZZO, MONICA SPOLAORE, Consorzio RFX, NICOLA VIANELLO, EPFL-CRPP — In the RFX-mod reversed-field pinch, when the magnetic field spontaneously develops a non axi-symmetric structure, also the plasma edge assumes a three dimensional shape. In previous RFX works, it has been shown that kinetic properties of the plasma (electron pressure, connection lengths, floating potential, influx, plasma flow) closely follow the symmetry of the 3D field, both in amplitude and phase, along the toroidal angle (i.e, the RFP perpendicular direction in the edge). Using a set of poloidally distributed diagnostics, it is shown that these same properties follow the poloidal periodicity (m=1) of the field. However, the behavior of the phase is more difficult to understand. In particular, the 3D modulation of the plasma potential can rotate in the poloidal direction with the typical velocity of 100m/s, similar in value with the phase velocity of the m=1 magnetic mode; or it can jump between inboard and outboard equatorial midplane. Moreover, when the floating potential structure rotates, there are preliminary indications that its direction depends on the plasma density: it follows the m=1 mode at higher density, and rotates in the opposite direction at lower density.

Matteo Agostini
Consorzio RFX

Date submitted: 21 Jul 2015 Electronic form version 1.4