

Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Ambipolar edge electric field with energy dependence G. SPIZZO, Consorzio RFX, Padova - Italy, R.B. WHITE, Plasma Physics Laboratory, P.O.Box 451, Princeton, NJ 08543, M. AGOSTINI, P. SCARIN, N. VIANELLO, Consorzio RFX, Padova - Italy — In a recent work,¹ it was shown that in the edge of toroidal confinement devices a sheath potential can arise when the ambipolarity constraint is applied to ion and electron motion in proximity of edge islands: in this way, the symmetry of the electric field is the same as the generating island. This was shown by analyzing ion and electron motion in presence of an electrostatic potential in a ~ 8 ion Larmor radius layer next the wall, by means of the guiding-center code ORBIT. Simulations show that there is a phase shift between the potential “island” and the magnetic island, with this difference $\phi_{pot} - \phi_{island} \approx \pi/2$ for monoenergetic ions and electrons with bulk energy. Measurements in the RFX reversed field pinch show that in experiment the phase shift depends on collision frequency, the value $\pi/2$ being its collisionless extrapolation. This suggests that there is an energy dependence during the potential formation. In this paper we will show initial results with the implementation of a full profile Monte Carlo operator, based on the energy scattering formula of Boozer-Kuo.²

¹G.Spizzo *et al.*, Nucl. Fusion **52** (2012) 054015

²A. H. Boozer A.H. and G. Kuo-Petravic, Phys. Fluids **24** (1981) 851

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Date submitted: 18 Jul 2012

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