

Abstract Submitted  
for the DPP14 Meeting of  
The American Physical Society

**Erosion due to ion sputtering in absence of Debye Sheath at Divertor plates: PIC simulation** K.S. GOSWAMI, S. ADHIKARI, Centre of Plasma Physics-Institute for Plasma Research — A 2D-3V Particle-in-Cell code with Monte Carlo Collision and a Plasma Surface Interaction Code written in Matlab is used to study the effect of grazing angle ( $\alpha$ ) on solid surface (divertor) erosion due to ion sputtering in magnetic fusion devices, where  $\alpha$  is the angle between the magnetic field and the surface tangent. The ion distribution in front of an absorbing wall is computed using a kinetic model. Important factors like ion energy and impact angle for wall erosion and sputtering are highlighted. The dependence of these two parameters on grazing angle is investigated in detail. Physical Sputtering for ion bombardment is strongly dependent on incident ion energy and this energy is mainly gained by the ions when they travel through the potential drop across the combined Chodura Sheath and Debye Sheath. The present work contains the study of two scenario. In the first one we have studied the usual case to compare our result to the other similar work i.e. in presence of both Chodura Sheath and Debye Sheath. In the second one with the idea of previous work [1] we have created the scenario where Debye Sheath cease to appear. The second scenario provides us the result that was never expected that the incident energy profile got reversed. The study is focused on the effect of grazing angle and its relation with the material erosion. Our study covers different materials (e.g. Be, Fe, W etc.) which are used as plasma facing components.

[1] P.C. Stangeby *Nucl. Fusion* **52** (2012) 083012

K.S. Goswami  
Centre of Plasma Physics-Institute for Plasma Research

Date submitted: 25 Jun 2014

Electronic form version 1.4