

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Rapid change of blob structure in the outer scrape-off layer (SOL)¹ R.H. COHEN, D.D. RYUTOV, LLNL, Livermore, CA 94550 — Nonlinear structures (“blobs”) driven by the magnetic field curvature and highly elongated along the field lines may exist in the tokamak SOL.² The contact of the blob end with the divertor plate significantly affects the blob structure and velocity. However, the strong shearing of the flux-tube near the X-point makes impossible direct electrical contact of the blob in the upper SOL and the divertor, so that the sheath boundary condition (BC) has to be replaced by a BC imposed near the X point.³ We show that, at larger distances from the separatrix, in the far SOL, the connection between the upper SOL and the divertor plate is re-established, and the sheath BC becomes again relevant. During the blobs outward radial motion, this event is reflected in a sudden change of its length, from the blob extending only to the X point to the blob extending down to the plate. Likewise, a blob initially existing only in the divertor leg becomes suddenly longer, and extends to the whole SOL.

¹Work performed for US DoE by UC LLNL under contract W-7405-Eng-48.

²S.I. Krasheninnikov. Phys. Lett. **A 283**, 368 (2001)

³D. Ryutov, R.H. Cohen. Contr. Pl. Phys **44**, 168 (2004)

Ronald Cohen
LLNL

Date submitted: 18 Jul 2005

Electronic form version 1.4