

Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Dependence of SOL widths on plasma parameters in NSTX
JOON-WOOK AHN, UCSD, RAJESH MAINGI, ORNL, JOSE BOEDO, UCSD,
VLAD SOUKHANOVSKII, LLNL, BEN LEBLANC, ROBERT KAITA, PPPL —
The dependence of various upstream Scrape-Off Layer (SOL) widths on the line-averaged density (\bar{n}_e), plasma current (I_p), and power into the SOL (P_{SOL}) for H-mode plasmas was investigated, using the mid-plane fast reciprocating probe and Thomson scattering diagnostics, in the National Spherical Torus Experiment (NSTX). The heat flux width (λ_q) at the divertor plate, measured by the IR camera, was also measured and compared with the upstream SOL widths. The edge density profile remains fixed during the H-mode, such that the separatrix density is constant even though \bar{n}_e is ramping. Thus λ_q , λ_{Te} , and λ_{ne} are insensitive to \bar{n}_e . λ_{Te} and λ_{jsat} have strong negative dependence on I_p , whereas there was only a very weak change in λ_{ne} when I_p was varied. These empirical results have been compared with scaling laws in the literature. The λ_{Te} dependence on I_p is consistent with an H-mode λ_{Te} scaling law, while the insensitivity of λ_{ne} to \bar{n}_e is not consistent with the λ_{ne} scaling law. Dependence of decay lengths on plasma parameters in a wide range of plasma conditions will be presented. This work was supported by the US Department of Energy, contract numbers DE-FG02-03ER54731, DE-AC02-76CH03073, DE-AC05-00OR22725, and DE-AC52-07NA27344.

Joon-Wook Ahn
UCSD

Date submitted: 18 Jul 2008

Electronic form version 1.4