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The Potential Contribution of RF Sheaths to Field-Aligned SOL Losses on NSTX[1] R.J. PERKINS, R.E. BELL, N. BERTELLI, S. GERHARDT, J.C. HOSEA, M.A. JAWORSKI, G.J. KRAMER, B.P. LEBLANC, R. MAINGI, C.K. PHILLIPS, G. TAYLOR, PPPL, J.-W. AHN, T.K. GRAY, E.F. JAEGER, ORNL, A. MCLEAN, None, S.A. SABBAGH, Columbia U. — NSTX can exhibit a major loss of high-harmonic fast wave (HHFW) power to the upper and lower divertor regions along scrape-off layer (SOL) field lines passing in front of the antenna [1]. One contributing loss mechanism is RF sheaths forming at the divertor at strike points of the magnetic field lines. Here we compare calculations of the Langmuir probe sheath transmission factor to infrared camera (IR) measurement estimates. At the probe, the sheath transmission increases by a factor of two with RF showing that the RF sheath losses at the divertor are significant. We will compare sheath voltage determined using the AORSA code [2] with the RF voltage measured at the Langmuir probe. Future experimentation on NSTX-U will employ a wide-angle IR camera and coaxial Langmuir probes to quantify the HHFW sheath losses.

[1] R.J. Perkins et al., Phys. Rev. Lett. 109 (2012) 045001.
[2] N. Bertelli et al., Nucl. Fusion 54 (2014).

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