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Glancing angle RF sheaths[1] D.A. D'IPPOLITO, J.R. MYRA, Lodestar Research Corp. — RF sheaths occur in tokamaks when ICRF waves encounter conducting boundaries. The sheath plays an important role in determining the efficiency of ICRF heating, the impurity influxes from the edge plasma, and the plasma-facing component damage. An important parameter in sheath theory is the angle θ between the equilibrium B field and the wall. Recent work with 1D and 2D sheath models has shown that the rapid variation of θ around a typical limiter can lead to enhanced sheath potentials and localized power deposition (hot spots) when the B field is near glancing incidence [e.g. D.A. D'Ippolito et al., Plasma Phys. Control. Fusion 55, 085001 (2013)]. The physics model used to obtain these results does not include some glancing-angle effects, e.g. possible modification of the angular dependence of the Child-Langmuir law and the role of the magnetic pre-sheath [J.R. Myra et al., Nucl. Fusion 30, 845 (1990)]. Here, we report on calculations which explore these effects, with the goal of improving the fidelity of the rf sheath BC used in analytical and numerical calculations.

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