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**3D Modeling of Antenna Driven Slow Waves Excited by Antennas Near the Plasma Edge** DAVID SMITHE, THOMAS JENKINS, Tech-X Corporation — Prior work with the 3D finite-difference time-domain (FDTD) plasma and sheath model used to model ICRF antennas in fusion plasmas has highlighted the possibility of slow wave excitation at the very low end of the SOL density range, and thus the prudent need for a slow-time evolution model to treat SOL density modifications due to the RF itself. At higher frequency, the DIII-D helicon antenna [1] has much easier access to a parasitic slow wave excitation, and in this case the Faraday screen provides the dominant means of controlling the content of the launched mode, with antenna end-effects remaining a concern. In both cases, the danger is the same, with the slow-wave propagating into a lower-hybrid resonance layer a short distance (˜cm) away from the antenna, which would parasitically absorb power, transferring energy to the SOL edge plasma, primarily through electron-neutral collisions. We will present 3D modeling of antennas at both ICRF and helicon frequencies. We've added a slow-time evolution capability for the SOL plasma density to include ponderomotive force driven rarefaction from the strong fields in the vicinity of the antenna, and show initial application to NSTX antenna geometry and plasma configurations. The model is based on a Scalar Ponderomotive Potential method [2], using self-consistently computed local field amplitudes from the 3D simulation. [1] R. Pinsker et al., 21st Topical Conf. on RF Power in Plasmas, (2015). [2] J. R. Myra, et. al., Nucl. Fusion 46, S455 (2006).

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