Full wave simulations of helicon wave losses in the scrape-off-layer of the DIII-D tokamak[1] CORNWALL LAU, Oak Ridge National Laboratory, FRED JAEGER, LEE BERRY, XCEL Engineering, NICOLA BERTELLI, Princeton Plasma Physics Laboratory, ROBERT PINSKER, General Atomics — Helicon waves have been recently proposed as an off-axis current drive actuator for DIII-D. Previous modeling using the hot plasma, full wave code AORSA, has shown good agreement with the ray tracing code GENRAY for helicon wave propagation and absorption in the core plasma. AORSA, and a new, reduced finite-element-model show discrepancies between ray tracing and full wave occur in the scrape-off-layer (SOL), especially at high densities. The reduced model is much faster than AORSA, and reproduces most of the important features of the AORSA model. The reduced model also allows for larger parametric scans and for the easy use of arbitrary tokamak geometry. Results of the full wave codes, AORSA and COMSOL, will be shown for helicon wave losses in the SOL are shown for a large range of parameters, such as SOL density profiles, $n_{||}$, radial and vertical locations of the antenna, and different tokamak vessel geometries.

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