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The transition from compressional Alfvén waves to whistler-like propagation in tokamaks[1] T.E. WHITTLE, Vanderbilt University, R.I. PINSKER, R. PRATER, General Atomics — In a cold magnetized plasma, the compressional Alfvén wave ($\omega \ll \Omega_i$) smoothly transitions to the fast wave at frequencies above $\omega = \Omega_i$ and connects to the whistler wave at higher frequencies. The accompanying changes in wave dispersion have important consequences for the propagation and damping of these modes in tokamak equilibria [1]. A theoretical model for this transition is being developed based on the full cold plasma dispersion relation. We study the effect of whistler-wave-like propagation in DIII-D equilibria with analytic models as well as the GENRAY ray tracing code. As the whistler-like regime is approached, the $n_\parallel$ upshift effect can have a decisive effect on the first-pass absorption in DIII-D cases, significantly enhancing damping on electrons beyond the level expected from simple theory.

[1] R.I. Pinsker, et al., Nucl. Fusion **46**, S416 (2006).

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