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Lower hybrid to whistler mode conversion on a density striation
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LANL — When a wave packet composed of short wavelength lower hybrid modes
traveling in an homogeneous plasma region encounters a density inhomogeneity,
it can resonantly excite long wavelength whistler waves via a linear mechanism
known as mode conversion. We study the linear mode conversion using a scalar-field
formalism (in the limit of cold plasma linear theory) which we solve numerically [1].
We show that the linear mode conversion can effectively transfer a large amount of
energy from the short to the long wavelength modes, and we study how the efficiency
scales for different width and amplitude of the density striation. We present a general
criterion for the width of the striation that, if fulfilled, maximizes the conversion
efficiency. Such a criterion could provide an interpretation of recent laboratory
experiments carried out on the Large Plasma Device at UCLA.

[1] E. Camporeale, G.L. Delzanno, P. Colestock, "Lower hybrid to whistler mode
conversion on a density striation," submitted to Journal of Geophysical Research
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