

Abstract Submitted
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A Bi-Frequency Linear Slow Wave Device¹ DAVID SIMON, PENG ZHANG, Y.Y. LAU, GEOFF GREENING, RONALD GILGENBACH, University of Michigan, Ann Arbor, BRAD HOFF, Air Force Research Laboratory — Bi-frequency sources are of interest to plasma processing, diagnostics, RF heating, and defense electronics. The recirculating planar magnetron [1] has been modified to produce two frequencies using two different slow wave structures in the planar regions. To highlight the coupling in the two frequencies, we consider here a linear TWT driven by a sheet beam inside such a structure. The cold tube dispersion is derived and is compared favorably with HFSS. The hot tube dispersion has also been derived, and is being compared with MAGIC simulations. Various nonlinear effects are explored, such as harmonic generation, parametric amplification, and intermodulation.

[1] R. M. Gilgenbach, et. al., IEEE Trans. Plasma Sci. 39, 908 (2011).

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