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Modeling of Magnetron Injection Locking Characteristics P. PENGVANICH, Y.Y. LAU, R.M. GILGENBACH, University of Michigan, Ann Arbor, MI, J.W. LUGINSLAND, NumerEx, Ithaca, NY — A magnetron-specific, phase-locking model has been developed [1] to qualitatively explain the various regimes observed in magnetron injection-locking experiments [2]. The experiments utilize two continuous wave oven magnetrons; one functions as an oscillator and the other as a driver. Both time and frequency domain solutions are developed from the model, allowing investigations into the growth and saturation as well as the frequency response of the output signal. This paper extends this locking theory for various configurations of magnetron coupling. Also studied is the general effect of driving frequency chirp on Adler's classical locking condition. This work was supported by AFOSR.

[1] P. Penvanich et al., J. Appl. Phys. 98, 114903 (2005).
[2] V. B. Neculaes, Ph.D. Dissertation, University of Michigan, Ann Arbor, MI (2005).

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