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Recent Advances in Magnetron Phase Locking: Effects of Frequency Chirps and Locking of Multiple Magnetrons[1] EDWARD CRUZ, PHONGPHAETH PENGVANICH, YUE YING LAU, RONALD GILGENBACH, University of Michigan, Ann Arbor, MI, JOHN LUGINSLAND, NumerEx, Ithaca, NY, EDL SCHAMILOGLU, University of New Mexico, Albuquerque, NM — Phase-locking is utilized today in many important applications, ranging from small scale devices such as cardiac pacemakers to large scale devices such as radar. We have recently developed a magnetron-specific model [1] to qualitatively explain the various regimes observed in magnetron injection-locking experiments [2], which utilize two continuous wave oven magnetrons; one functions as an oscillator and the other as a driver. We have applied this model to study injection locking when the driver has a frequency chirp. The model has also recently been extended to analyze peer-to-peer locking of two magnetrons of comparable powers and frequencies. The feasibility of locking will be explored in terms of the variations in these parameters of the individual magnetrons, as well as the degree of coupling among them. Locking of a larger number of such magnetrons will be explored. A preliminary experiment is being conducted on the peer-to-peer locking of two oven magnetrons. [1] P. Pengvanich, et al., J. Appl. Phys. **98**, 114903 (2005). [2] V. B. Neculaes, Ph.D. Dissertation, U. Michigan, Ann Arbor, MI (2005).

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