

Abstract Submitted  
for the DPP06 Meeting of  
The American Physical Society

**Design of higher-harmonic gyrotron oscillators with frequency-multiplied pre-bunched beams**<sup>1</sup> ARNE FLIFLET, MELISSA HORNSTEIN, STEVEN GOLD, Plasma Physics Division, Naval Research Laboratory — There is currently considerable interest in operating gyrotrons at higher cyclotron harmonics in order to access the near-THz regime and reduce magnetic field requirements. Bandurkin and Savilov<sup>2</sup> recently proposed a scheme for bunching of gyrating electron beams at a multiple of the signal frequency based on Bragg cavities. In this work we investigate the use of this bunching technique to enhance higher-harmonic operation in gyrotron oscillators with annular beams. We compute the frequency-multiplied prebunching for given Bragg cavity parameters and use a large-signal, multimode, multi-harmonic gyrotron oscillator code to predict the parameter regions of stable higher-harmonic operation for several point designs.

<sup>1</sup>Supported by the Office of Naval Research.

<sup>2</sup>I.V. Bandurkin and A.V. Savilov, Phys. Rev. ST 8, 010702 (2005).

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Date submitted: 25 Jul 2006

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