Contribution ID: **3160** Type: **not specified**

P1.2014 A paradigm model for studying the nonstationary behavior of gyrotron backward wave oscillators

Monday, 8 July 2019 14:00 (2 hours)

See the full abstract here:
http://ocs.ciemat.es/EPS2019ABS/pdf/P1.2014.pdf

A paradigm model is proposed for the study of the nonstationary behavior of gyrotron backward wave oscillators. The model is first examined by comparisons with the PIC simulation, large signal theory and the linear theory for retaining the basic ingredient of formulations about the mechanism of electron cyclotron resonance maser. The physical reason for the alternating appearance of the nonstationary behaviors of gyrotron backward wave oscillators [1] - [3] with the increase of beam current at different interaction lengths is thus possibly explored by the theoretical analysis on the basis of the paradigm model.

[1] T. H. Chang, S. H. Chen, L. R. Barnett, and K. R. Chu, Physical Review Letters Physical Review Letters 87, 064802 (2001).
[2] S. H. Chen, T. H. Chang, K. F. Pao, C. D. Fang, and K. R. Chu, Physical Review Letters 89, 268303 (2003).
[3] S. H. Chen and L. Chen, Physics of Plasmas 20, 123108 (2013).

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Session Classification: Poster P1

Track Classification: BPIF