

Abstract Submitted
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Small-Signal Gain Theory of a Planar Magnetron¹ JING ZHOU, CHIPING CHEN, Plasma Science and Fusion Center, Massachusetts Institute of Technology, Cambridge, MA 02139 — A planar magnetron model is developed to analyze the small-signal theory of a magnetron. The analysis includes a full Floquet expansion and fully electromagnetic effects. The present planar model avoids the problem of multiple poles (singularities) and the model is a good approximation, provided that the A-K gap is small compared with the cathode radius. An analytical dispersion relation of such a planar magnetron is derived and the growth rate is calculated based on the dispersion relation. MAGIC2D simulations are performed on the planar magnetron. The simulated growth rate is found in good agreement with the theoretical prediction.

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