Abstract Submitted
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Resonances in Saturated Stage of a Magnetron[1] D.J. KAUP, Univ. of Central Florida — Theoretical studies of the cold-fluid model of crossed-field electron vacuum devices such as magnetrons and crossed-field amplifiers have shown that there are two important stages to their operation [1]. First there is the "initiation stage" wherein an instability in the rf fields grows. When this instability saturates, the device enters into the "saturation stage." A drift (diocotron) resonance dominates this stage. The importance of the rf drift resonance to the steady operation of the device is clear from the fact that this resonance can only significantly couple to the usual rf modes of the initiation stage when it is located along the "edge" of the sheath. Theory [1] has outlined the major features of the drift resonance in the saturation stage, however a complete understanding requires a study of numerical solutions. The problem here is one of scales. In the initiation stage there are two rf modes with oscillations on the order of unity. In the saturation stage there are five rf modes; the original two modes of the initiation stage and three additional fast modes with fast vertical oscillations on the order of 100-1000 times that of the initiation rf modes. We will present a WKB approach to decompose the rf equations of the saturated modes into individual modal equations, which can be rapidly integrated numerically. Computational results using this method will also be presented. [1] D.J. Kaup, Phys. Plasmas **13**, 053113 (2006).

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