

Abstract Submitted  
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**Numerical study of the start-up scenario of a 670 GHz gyrotron operation at  $TE_{31,8}$  mode**<sup>1</sup> RUIFENG PU, University of Maryland, OLEKSANDR SINITSYN, GREGORY NUSINOVICH, IREAP TEAM — In order to develop a system to detect concealed radioactive materials, we are designing a 670 GHz gyrotron with sufficient power to cause breakdown in the air. Design studies of the cavity and the magnetron injection gun (MIG) of this gyrotron had already been presented. We concluded study of simple start-up regime for this 670GHz gyrotron operating at  $TE_{31,8}$  mode and found that at the fundamental cyclotron harmonics, the operating mode can be excited and the competitor modes will be suppressed. Currently we are studying gyrotron operating on the second cyclotron harmonics using the same electron gun. Preliminary studies show that if the higher harmonics mode is excited first, it will suppress competitors of the fundamental mode. Using available MIG data, we are performing numerical simulation using MAGY. The results of these simulations can be illustrative for our future experiments, and the results of the study will be presented at the conference.

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