

Study on Estimating the Limiting Dimensions of Coaxial Inserts for Sub-THz Megawatt Gyrotrons

Gyrotrons are an enabling technology for magnetically confined **nuclear fusion reactors**. The challenge? The maximum output power is limited by losses in the cylindrical resonator.

Our project aims to determine the minimal dimensions of the inner conductor for future gyrotrons operating around 300 GHz that can still be efficiently cooled. Through a combination of **electromagnetic** and **thermohydraulic simulations** of the resonator and its cooling system, we provide groundbreaking insights for heating concepts in future nuclear fusion reactors.



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