Optimization of a high-power coaxial coupler to 1800 waveguide coupler with high input power using CST simulator controlled by MATLAB

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(Received 18 February 2017 ; in final form 16 July 2017)

Abstract
Coaxial couplers with high input RF power, usually operated at 500 MHz, are one of the critical components used in accelerators. To withstand high RF power, the couplers should be tested first, under identical conditions in a test stand. A waveguide coupled to a coaxial cable is used for this purpose. The parameter that indicates the amount of returned power loss is $S_{11}$ which is reduced by optimizing the dimensions of the proposed model. MATLAB program has special and powerful tools to optimize the dimensions of models simulated in CST STUDIO SUITE. In this paper, the details and processes of how MATLAB can control CST are described using MATLAB. Then, the optimization of coaxial coupler coupling to 1800 waveguide with high input power is carried out.

Keywords: accelerators, coupler, high power, optimization, CST, MATLAB

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