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Thermal analysis for the fundamental power coupler of the 197 MHz crab cavity for EIC

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The Electron-Ion Collider (EIC) is being designed by BNL in collaboration with Jefferson Lab. The Phase-I design includes the installation of two cryomodules of 197 MHz crabbing cavities installed at the Hadron Storage Ring (HSR) at the interaction region, IP6 that has a crossing angle of 25 mrad. Each cryomodule consists of two 197 MHz RFD type crabbing cavities. The first article cavity has been designed following the machine requirements and specifications including the fundamental power coupler (FPC), higher order mode couplers, and field probes. A detailed rf analysis has been completed to determine the worst operational case of the FPC. Next, the thermal analysis was carried out to design the warm-to-cold section of the FPC. This paper presents the detailed rf and thermal analysis of the 197 MHz first article crabbing cavity.

Footnotes

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