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X-band activities for the EuPRAXIA@SPARC_LAB Linac

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Over recent years, significant efforts have been dedicated to validating the reliability and functionality of X-band technology at extremely high peak fields and accelerating gradients to achieve the realization of increasingly compact linacs. The Eupraxia@SPARC_LAB project entails the development of 1GeV Linac utilizing a X-band booster comprising 16 accelerating structures operating at a nominal gradient of 60MV/m. At the Frascati laboratories of INFN (LNF) in the last year various X-band RF components essential for the Eupraxia Linac have been developed and have been tested at nominal peak power conditions. This was made possible thanks to the use of the TEX test facility devoted specifically for the development and testing of RF devices and accelerating structures in the X-band. Recently, the first RF prototype of X-band accelerating structure designed at LNF has been manufactured and tested at high power. This report presents the results of the latest tests conducted at TEX and the preliminary results of the conditioning of the first accelerating structure prototype for the EuPRAXIA@SPARC_LAB project.

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Primary author: CARDELLI, Fabio

Co-authors: LIEDL, Andrea; BUONOMO, Bruno; DI GIULIO, Claudio; ALESINI, David; DI PASQUALE, Enrico; DI RADDIO, Gianluca (INFN-LNF); LATINI, Giulia; PIERSANTI, Luca (INFN-LNF); DIOMEDE, Marco; PIOLI, Stefano; LOLLO, Valerio (INFN-LNF)

Presenter: CARDELLI, Fabio

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