RECENT RESULTS OF TESTING 3-CELL 3.9 GHz ACCELERATING CAVITY AT FERMILAB

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Abstract

A superconducting, 3.9 GHz, third harmonic, accelerating cavity was proposed to improve the beam quality in the TTF photoinjector. Fermilab developed, built, and tested several prototypes, including two copper 9-cell cavities and one niobium 3-cell cavity. In the 3-cell cavity, E_{acc} = 19 MV/m, B_{peak} = 103 mT, and R_{res} = 6 nOhm were achieved at 1.8K without field emission. The accelerating gradient was likely limited by thermal breakdown. The quench limit was almost independent of temperature, and can be explained by the field dependence of the residual resistance, which was observed in the experiment. In this paper, we discuss the status of the cavity development and our future plans.

NO SUBMISSION RECIEVED