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Frequency pre-tuning of the 166.6 MHz hom-damped srf cavities for HEPS

Wednesday, 10 May 2023 16:30 (2 hours)

A higher-order-mode-damped 166.6 MHz beta=1 quarter-wave superconducting cavity is being developed for the High Energy Photon Source. The frequency variation of the cavity in all the processes comprising of manufacturing, post-processing and cooldown to 4.2 K, should be strictly controlled due to the relatively small coarse tuning range. The step-by-step evolution of the cavity frequency was determined and the target frequency after fabrication was given. The pre-tuning scheme during fabrication was made in which the length of the inner conductor and the outer conductors are the free parameters for frequency pre-tuning while the cavity length is kept constant. The environment of the cavity in the cryomodule was considered in the analysis. Three bare cavities and one jacketed cavity were fabricated, post-processed and vertical tested with careful frequency monitoring. The measured frequencies were consistent with the predictions in each process.

Funding Agency

Footnotes

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Yes

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