

PAC 2022 Abstract

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Title Operational Experience of the New Booster Cryomodule at the Upgraded Injector Test Facility

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Abstract Since the early 1990s, the injector of the CEBAF accelerator at Jefferson Lab has relied on a normal-conducting RF graded-beta capture section to boost the kinetic energy of the electron beam from 100 keV to 600 keV for subsequent acceleration using a cryomodule housing two superconducting 5-cell cavities similar to those used throughout the accelerator. To simplify the injector design and improve the beam quality, the normal-conducting RF capture section and the cryomodule will be replaced with a new booster cryomodule employing a superconducting, beta=0.6, 2-cell-cavity capture section and a single beta=0.97 7-cell cavity. The Upgraded Injector Test Facility at Jefferson Lab is currently hosting the new cryomodule to evaluate its performance with beam before installation at CEBAF. Though presently limited to 100 nA CW current due to radiation shielding limitations, our measurements demonstrate the viability of the new booster cryomodule. Apart from showcasing the experimental applications, we present insight into the microphonics and instrumentation issues arising from the operation of such a machine located above ground in a busy building.

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Footnote

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