

THE AES/BNL SRF PHOTOCATHODE ELECTRON GUN

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Abstract

Advanced Energy Systems and Brookhaven National Lab are collaborating to design and build a superconducting photocathode electron gun to ultimately be tested at BNL's ERL test facility. VTA testing and cavity string integration will be performed at JLAB. The gun will operate at 703.75 MHz and will produce a 2 MeV CW current of 0.5 Amps. The beam will have 1.33 nC bunch charge. Transverse emittance is projected at 5.5 mm-mrad (rms), longitudinal emittance at 42 keV-psec (rms), energy spread at 3.1%, and bunch length at 7.2 psec rms. We are currently finalizing the physics design of the gun cavity. In parallel we are working on the mechanical design of the cavity, cavity string, and cryomodule. A significant thermal and structural analysis effort is also underway. Fabrication is expected to begin in November of this year. Cleaning and VTA testing of the cavity should begin in August of 2006 followed by cavity string cleanroom assembly at JLAB. Integration of the coldmass will take place at BNL in November of 2006, with testing to commence at BNL in March of 2007.

NO SUBMISSION RECIEVED