

LLRF System For TRIUMF 1.3GHz SRF e-Linac

The ARIEL (Advanced Rare IsotopE Laboratory) facility is a superconducting electron linear accelerator (e-linac) project and is under construction at TRIUMF. The e-linac consists of an electron gun, an injector cryomodule (ICM) containing one 9-cell accelerating RF cavity and two accelerator cryomodules (ACMs) each containing two 9-cell RF cavities. The key feature of this e-linac is 50MeV 10mA continuous-wave(CW) accelerator utilizing superconducting bulk niobium technology at 1.3GHz.

The low level radio frequency (LLRF) system is set up by using the self-excited mode for the operation of the 1.3GHz high Q SRF cavities. The heterodyne technique of up and down converter is chosen to manipulate the 1.3GHz frequency and the intermediate frequency (IF) of 138MHz for RF signal processing. This paper presents the design schematic diagrams, some measurement and preliminary testing results for the LLRF system.

Primary author: ZHENG, Qiwen (TRIUMF)

Presenter: ZHENG, Qiwen (TRIUMF)