

Helical Muon Beam Cooling Channel Engineering Design

The Helical Cooling Channel (HCC), a novel technique for six-dimensional (6D) ionization cooling of muon beams, has shown considerable promise based on analytic and simulation studies. However, the implementation of this revolutionary method of muon cooling requires new techniques for the integration of hydrogen-pressurized, high-power RF cavities into the low-temperature superconducting magnets of the HCC. We present the progress toward a conceptual design for the integration of 805 MHz RF cavities into a 10 T Nb₃Sn based HCC test section. We include discussions on the pressure and thermal barriers needed within the cryostat to maintain operation of the magnet at 4.2 K while operating the RF and energy absorber at a higher temperature. Additionally, we include progress on the Nb₃Sn helical solenoid design.

Primary author: Dr FLANAGAN, Gene (Muons, Inc.)

Presenter: Dr FLANAGAN, Gene (Muons, Inc.)