**Abstracts for NAPAC2022**

**TE011 Cavity for Monitoring Magnetic Momentum of a Magnetized Beam**

M.A. Mamun1, J. Guo1, B.F. Roberts2, R. Suleiman1, H. Wang1, M. Poelker1, G. Park1, J. Henry1, and R. A. Rimmer1,

1Thomas Jefferson National Accelerator Facility, 12000 Jefferson Ave., Newport News, VA 23606  2Electrodynamic, 4909 Paseo Del Norte Ne suite D, Albuquerque, NM 87113

Future Electron-Ion Colliders relies on cooling of the ion beam to achieve the high luminosity requirement. A bunched beam cooler uses magnetized electron beam from the injector for which a non-invasive measurement of the magnetic momentum is highly desired. The electric field of a passive copper RF cavity in TE011 mode has only azimuthal component. TE011 mode in an ideal pillbox cavity will have energy exchanging interaction with the azimuthal motion of a particle which makes it an ideal candidate for magnetic momentum monitor. This contribution presents the beam based preliminary test results from a 2994MHz TE011 pillbox cavity with 3mm wall thickness.

Authored by Jefferson Science Associates, LLC under U.S. DOE Contract No. DE-AC05-06OR23177. Additional support comes from Laboratory Directed Research and Development program.

Main Classification: 06. Beam Instrumentation and Controls