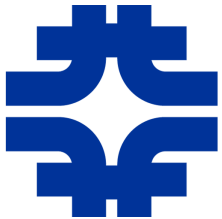


MTA Status



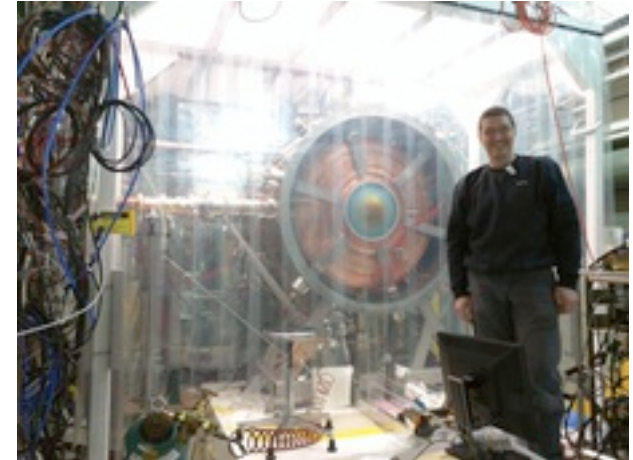
Yağmur Torun
Illinois Institute of Technology



MAP Weekly Meeting
FNAL – Feb 26, 2016

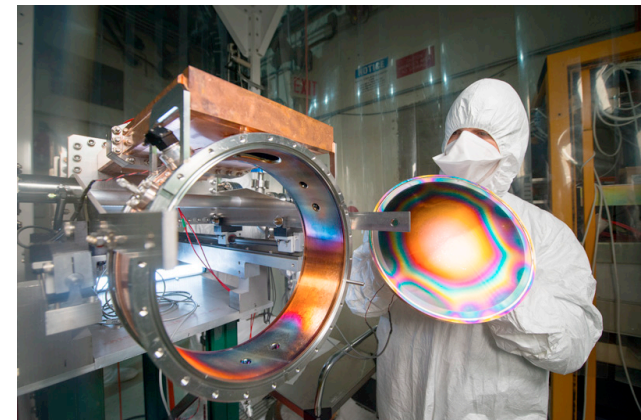
- MICE

- production couplers cleaned, re-assembled
- cavity inspected, spacer installed
- couplers replaced
- final RF Module validation run in progress



- HPRF cavity

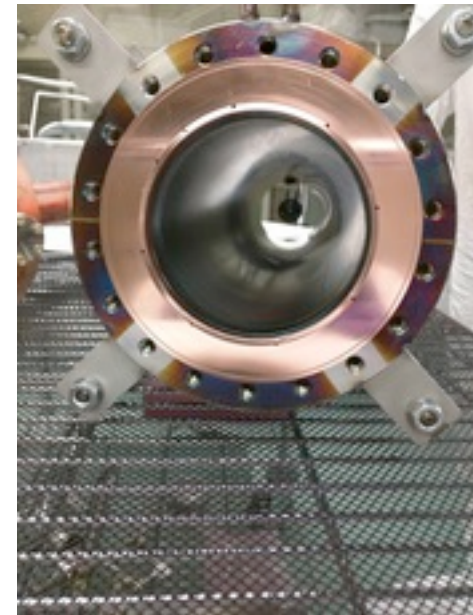
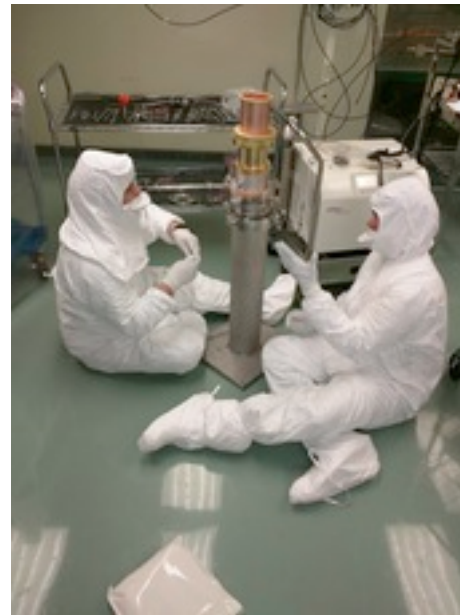
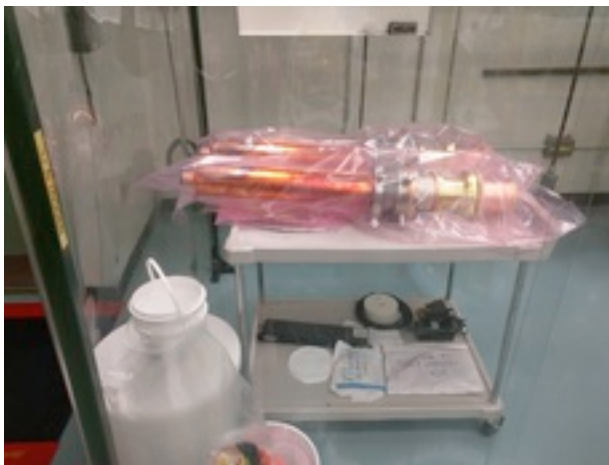
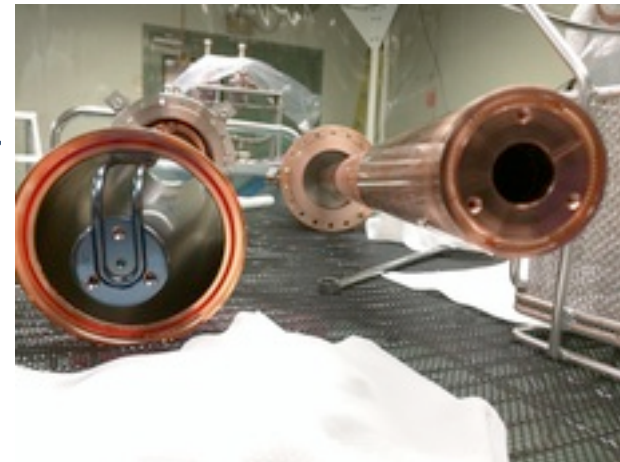
- ran 99.8% Al₂O₃ donut with new electrodes
- new coupler installed, tested



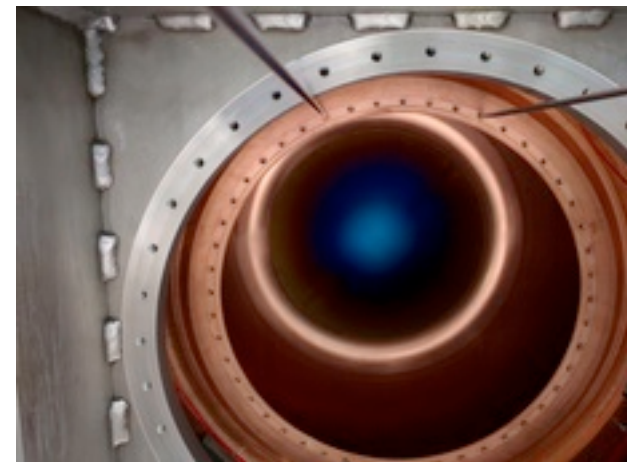
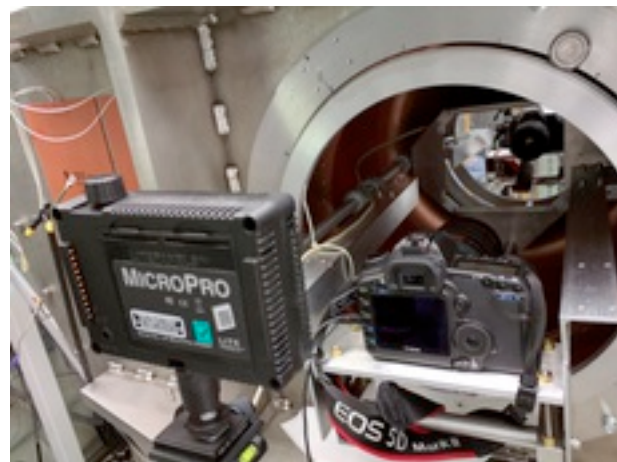
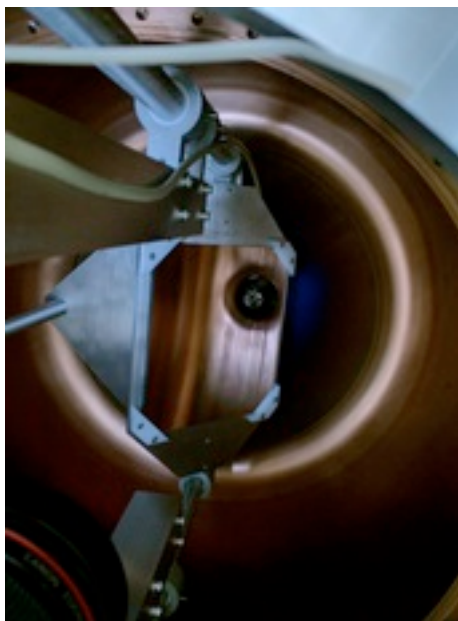
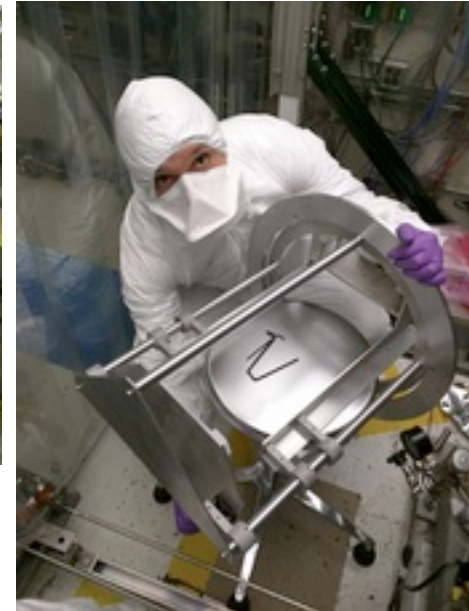
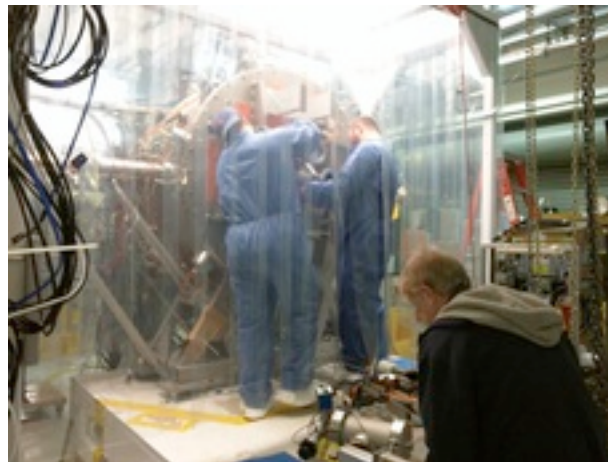
- Modular Cavity

- re-ran at B=0
- disassembled, inspection in progress

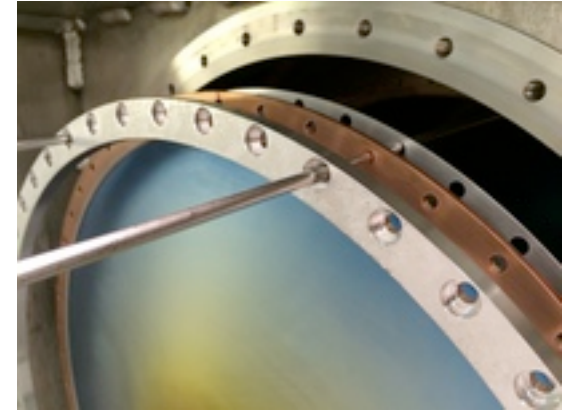
- First pair of production couplers received late January
 - moved to MTA clean room, leak checked Jan 27
 - noticed inner surfaces of outer conductors needed cleaning
 - taken to A0 Jan 29
 - partially disassembled, cleaned, re-assembled, leak checked, bagged Feb 1



- Inspection Feb 3
 - vessel opened
 - cavity/couplers viewed using custom fixture

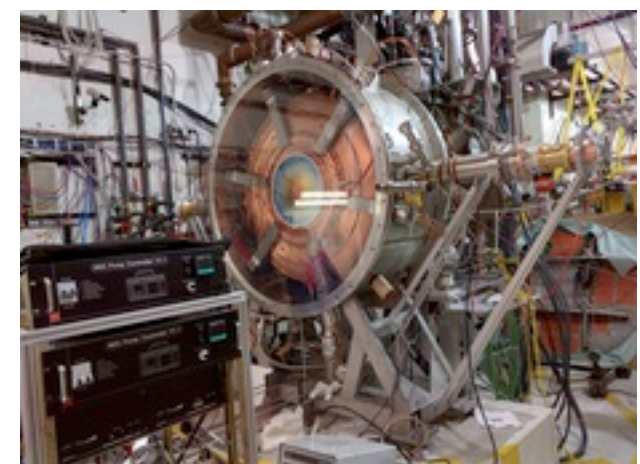
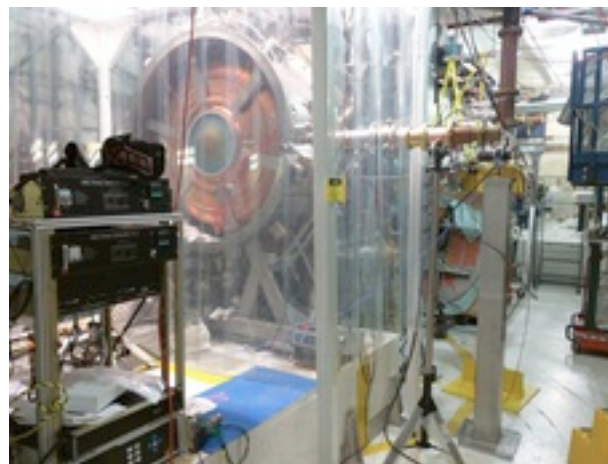


- Spacer ring installed Feb 4
 - target frequency 201.25 MHz
 - cavity frequency was around 200.8 MHz
 - tuner range +300/-400 kHz
 - tuning tricky around $\Delta f = 0$ (hysteresis)
 - Cu spacer ring under windows simulated (Tianhuan)
 - measurements during Jan 2015 assembly work with Al spacers => good agreement
 - single spacer built for downstream (convex) side (easier access)
 - Cavity frequency now around 201.3 MHz
 - well within tuning range

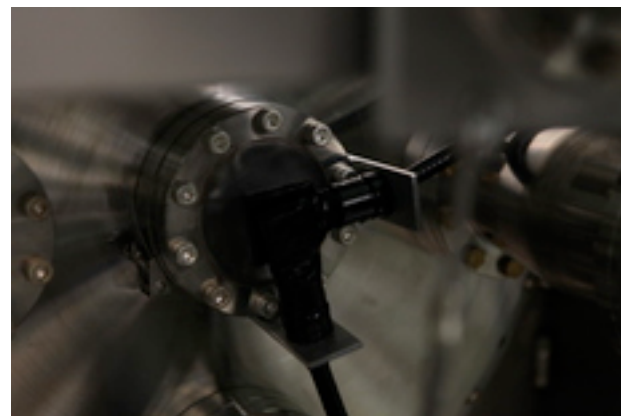
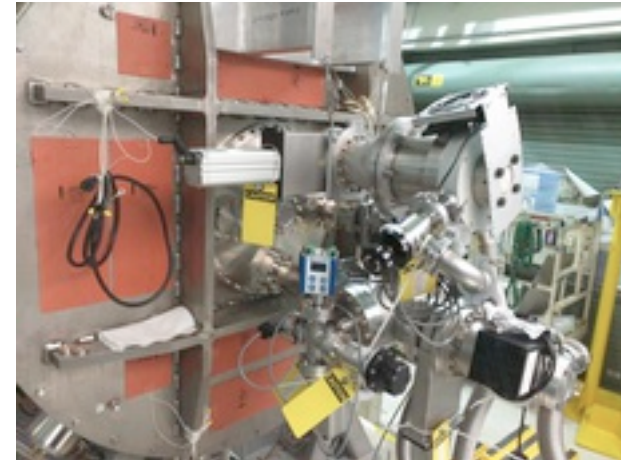


Fermilab MICE RF Module Prototype

- Production couplers installed, adjusted Feb 6
 - much easier to adjust with new outer conductor flange lip
 - Should be easier on production vessels
 - within 2% of critical coupling
 - 2 arms balanced to about 1%



- Dark current measurements
 - both center ports on vessel now open
 - thin Be RF + Ti vacuum windows
 - counters rebuilt with fast scintillator and fast PMTs (Katsuya)
 - possible to follow field emission on time scale of RF period
 - also useful for detecting multipacting bands
 - other diagnostics in place (NaI counter, ionization chambers)



- Assembly and coupler commissioning
 - vessel pump-down started Feb 9
 - broken turbo pump replaced
 - instrumentation re-installed, ready to run Feb 19
 - vacuum leak at the last minute
 - Sealed quickly
 - run started Feb 20 ($B=0$)
 - 1.8M pulses
 - 400k @ 10.3 MV/m
 - will turn on B-field next

- HPRF
 - working on modified donuts
 - preparing for beam test
- Modular Cavity
 - re-run post B=0 conditioning
 - Be endplates
- MICE
 - inspect old (prototype) couplers
 - send parts to LBNL
 - complete present run for RF module qualification
 - explore dark current with new detector configuration
 - prepare for beam test
- Contingent on availability of RF sources, tech labor
- Analysis/documentation effort continuing
 - surface mapping and analysis, detector calibration
 - HPRF beam PRST-AB close to final
 - other publications in preparation