

# SSR1 Cryomodule Development for PXIE

September 2011



- 8 cavities, 4 solenoids in this sequence: C-S-C-C-S-C-C-S-C-C-S-C.
- 4 BPMs (1 near each solenoid).
- Overall length ~5.4 m.
- Physical aperture = 30 mm.
- Period = 1250 mm (solenoid to solenoid spacing).
- Beamline interfaces to HW cryomodule, beam diagnostics, and future SSR1.
- Last HW cavity to first SSR1 cavity spacing ~74-87 cm (try to minimize).
- Cryogenic circuits don't span SSR sections, i.e. no connection other than beam pipe to HW cryomodule or other SSR1.
- Cavities operate at 2 K, solenoids operate at TBD K.
- Cavity string pre-assembled in the clean room. Terminated by beam valves on both ends.
- Some maintenance items possible without removing cryomodule from tunnel, e.g. tuner motor replacement.
- Magnetic shield inside vacuum vessel and around solenoids.
- Thermal intercepts at 5 K and 70-80 K, but single thermal shield at 70-80 K.
- More...



- Alignment requirements for cavities and solenoids?
- Heat load limitations per cryomodule?
- 2 K pressure stability specification?
- Solenoids
  - 2 K or 4.5 K
  - forced flow or conduction cooled
  - operating current
  - number of steering correctors
- Current leads
  - vapor cooled
  - conduction cooled copper/bronze
  - HTS
- Input coupler
  - one window or two
- Tuner
  - one sided or two
  - internal or external motor and piezos
- Alignment viewports at cryomodule ends?
- Any internal beam diagnostics other than BPMs?
- More...



- Mechanical engineers
  - 6 or 7 full and part-time starting now
- Design drafters
  - 2 full time – 1 starting soon
  - Others added as design evolves
- Technicians
  - 1 or 2 available as needed





