MERIT Progress Report

Collaboration Phone Meeting

September 21, 2007
Outstanding Issues

Issues at end of previous (July 6) phone conference
• Installation of the Pulsed Solenoid
• Toward resolving the Access Issue
• Installation of the Cryogenics
• Commissioning of the beamline
• Commissioning of the PS

New Issues
• SMD (Ultrafast) Camera Failed
• Excess heating of the Pulsed Solenoid
  – Solenoid integrity
  – Optics
Installing the Solenoid
The MERIT (nTOF11) Experiment

MERcury Intense Target
Installation in the CERN TT2a Line

Before Mating

After Mating and Tilting
Installing the D201 Barrier/Gate

August 28, 2007
Installing Beam Instrumentation
First Beam August 24

14 GeV
2 \(10^{11}\) ppp
\(\sigma_x\) (rms) 7mm
\(\sigma_x\) (rms) 4mm
MERIT Commissioning

Secondary Container For Hg Injector

15T Pulsed Solenoid

Al Cathode and Diamond Detectors

Diamond Wave Form Aug. 24
2 x 10^{11} protons at 14 GeV

View of experiment looking upstream in TT2a

20m/s 1cm Hg Jet with 0T field Aug. 29
Cryogenics – Layout

- LN2 dewar
- N2 gas bottles and heat exchanger
- Warm gas exhaust line to TT10
- Cold valve box
- LN2 transfer line
- Proximity cryogenics: CVB and Heat Exchanger
- Solenoid
- Transfer lines
Cryo Installations

Transfer Lines to the Solenoid

Surface Cryo Components
The Cryo DVB and Heater
Excess Heating of the Solenoid

Friday Sept. 8
- Low-intensity beam commissioning conducted
- At conclusion Main Control advises power supply group OK to place PS on standby status
- PS delivers constant 60A to cryostat

Monday, Sept. 10
- Problem discovered- PS turned off
- Solenoid temperature peaks at 175° C

Monday, Sept. 17
- Solenoid allowed to passively cool to 75° C
The Coil Leads

Hipot Test

Outer 8GΩ
Middle 90GΩ
Inner 50GΩ

May 31, 2007
HiPot Test Sept. 19

- Outer Coil: 500 MΩ
- Inner Coil: 600 MΩ
- Middle Coil: 0.5 MΩ
Optical Diagnostics

Reflectors

Illumination, Lens and Imaging

One set of optics per viewport

T. Tsang, BNL
Viewport 1, Sep. 5, 2007

Viewport 1, Sep. 19, 2007

Temperature (ºC) on HPU display
Primary : 77
Secondary : 30
Primary Optics Alignment
The Optical Diagnostic Cameras

FastVision 1

SMD

FastVision 2

video camera

20 m/s Hg jet, 7 Tesla field

0.1 ms/frame

2 ms/frame
The SMD Camera

Problem diagnosed as framegrabber failure. New framegrabber was secured and has been integrated into the diagnostics system.
Status September 21

Solenoid is being actively cooled to RT. Further diagnostics will be done.

A TT2a access is requested to permit re-alignment of the primary optics.

The SMD camera will be returned to port 2.

Further commissioning of the proton beam is underway. Intense proton beam will be delivered.

MERIT physics run scheduled for Oct. 22-Nov. 12.