

APS-TD Helium Cryogenic Facilities

Cryogenic Operations Department

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Cryomodule Test Facility

Cryogenic System:

- CMTF cryogenic system is supplied by a state of the art Superfluid Cryogenic Plant to supply 40K, 5K, and 2K helium up to 500 W. 2K operations achievable through cold or warm compression systems.

Currently Supports:

- Cryo Module Test Stand 1 (CMTS1) used to test 1.3 GHz & 3.9 GHz cryomodules for the LCLS-II project.
- PIP-II Injection Test Stand (PIP-II IT) program to test the front end of the future PIP-II Linac and production cryomodules



Superfluid Cryogenic Plant



Cryomodule Test Stand 1

New Muon Lab (NML)

Cryogenic System:

Two Tevatron satellite refrigerators capable of 125 L/hr 4.5K liquefaction rate. Kinney Vacuum Pump enables 2 K operations with maximum 2K capacity of ~60W.

Currently Supports:

NML Cryogenic System cools a cryomodule and two capture cavities to support the Integrable Optics Test Accelerator (IOTA) ring to support accelerator R&D through 150 MeV electrons from RF linear accelerator



NML Cryomodule



Kinney Vacuum Pump



Joe Hurd
CMTF



Renzhao Wang
IB1



Jerry Makara
HAB and MC-1



Joaquim Creus Prats
NML



Jeewan Subedi
MDB

Industrial Building 1 (IB-1)

Cryogenic System:

- CTI 1500 Cold Box provides up to 300 Liters per hour of liquid helium. The system has 4 Kinney vacuum pumps to enable 2 K operation

Currently Supports:

- Test Stand 3 – magnet tests including LCLS-II SPQA, Mu2e HTS lead and splice
- Test Stand 4 – being modified to support HILUMI horizontal magnet testing
- LTCF - low temperature calibration of instrumentation including RTDs
- Vertical Test Stands (VTS) – 3 test stands for SRF cavity R&D and qualification tests for LCLS-II and other projects
- Vertical Magnet Test Facility (VMTF) - Magnet R&D and tests



Vertical Test Stand (VTS)



Kinney Vacuum Pump

Meson Cryogenic Test Facility

Cryogenic System:

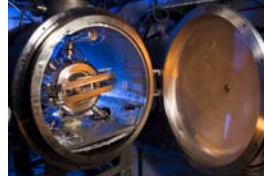
- Three Tevatron style satellite refrigerators capable of ~1000W at 4.5K. A Kinney vacuum pump enables 2K operations to support single cavity loads of 10-20W.

Currently Supports:

- Horizontal Test Stand (HTS) – Integrated cavity tests with fundamental power couplers and tuner, supporting LCLS-II 1.3 GHz and 3.9 GHz testing
- Spoke Test Cryostat (STC) – PIP-II 325 MHz Single Spoke Resonator integrated cavity tests, and being upgraded to test 650 MHz cavities for PIP-II
- Rapid Cycling Magnet Test Stand – International Advanced Accelerator R&D Fast-Cycling SC Magnets Tests



Horizontal Test Cryostat



Spoke Test Cryostat (STC)

Heavy Assembly Building (HAB)

Cryogenic System:

The helium cryogenic system consists of two Mycom screw compressors (60 g/s) supporting a 600 Watt at 4.5 K cryogenic plant previously used for the Tevatron Collider Detector Facility (CDF).

Currently Supports:

Testing of superconducting transport solenoids (14) for the future Mu2e experiment at Muon Campus. The test stand in the CDF pit consists of a cryostat with two removable top heads where solenoids are mounted and then inserted into the cryostat.



HAB Cryostat

Muon Campus 1 (MC-1)

Cryogenic System:

Consists of four Mycom compressors at A0 supporting four refurbished Tevatron 600 Watt @4.5 K cryogenic plants at MC-1.

Currently Supports:

Provides cooling to the g-2 experiment's superconducting magnet (from Brookhaven) and future Mu2e transport solenoids.



Muon g-2 Experiment



MC-1 Refrigerator Room

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