NCNR DUNE
THE MOTION PICTURE EVENT FOR 1984
THE SPICE MUST FLOW NEUTRONS
2017 OUTAGE

PROJECTS

for S.E. R&D

Juscelino Leão
Projects:

- Empty powder sample cans for BT7/BT1
- SANS LIPPS pressure and temperature control
- SANS high temperature furnace
- Oscillating pressure cell for SANS/USANS
- High pressure in $^3$He Big Blue

Maintenance:
- High pressure system
- High temperature furnaces
- Gas loading equipment
- MANIACS
- Reflectometry Wet Cell

Off line measurements:
- AC susceptibility of MoTe2
- Conductivity of modified closo-borate electrolytes
- Solubility of Xenon gas
I’ll be on vacation from October 4th thru October 23rd, 2017
Powder Sample Cans for BT1/BT7

~ 50 powder sample cans as of now

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SANS LIPPS pressure and temperature control

4 kbar liquids cell

Sample is injected

Pressure media separator

4 kbar powders cell

Current:
Sample volume: < 10 cc
255 K ≤ T ≤ 353 K

Target:
Sample volume: < 3 cc
173 K ≤ T ≤ 400 K
SANS LIPPS pressure and temperature control
SANS LIPPS pressure automation

New:
- Computer controlled software
- Automated valves rated to 4 kbar
- Piston replacement (4kbar)
SANS High Temperature Furnace

Current:
Tmax ≤ 500 °C

Target:
Tmax > 800 °C
Reduce time to Tmax

New temp control:
Phase angle control mode:
RMS load $V^2$ or $I^2$
Oscillating Pressure Cell for SANS/USANS

- Piezo actuator with 30 μm travel
- Three pressure fittings
- Sapphire windows
- High pressure in $^3$He Big Blue

- 10 kbar Pressure cell
- High pressure line heat sunk to shields
- Pressure change at 70 K

Preliminary test:
- $T_{\text{min}}=300\ mK$
- $T$ gradient $< 10\ mK$
General Maintenance

High pressure system:
- Pressure rig casters
- Pressure line
- Pressure lines heaters

High temperature furnaces
- BNL: Replace T sensors
  - Replace control SSR
  - Pressure control relay

1600C Furnace:
- Rewire T sensors
- Clean sample stick
- Replace vacuum controller

Gas loading equipment
- Sample sticks line heaters
- CCR collars
- Replace pressure controllers

SERVING THE COMMUNITY
Multi Application Neutron In-situ AC Susceptometer (MANIACS)

Vertical Linear Translator

New Sample Stick

AC Coils Support

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Reflectometry Wet Cell

Old cell

New cell
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