



**SOUTH  
DAKOTA  
MINES**

# Long-term voltage monitor system for OPC (PoF)

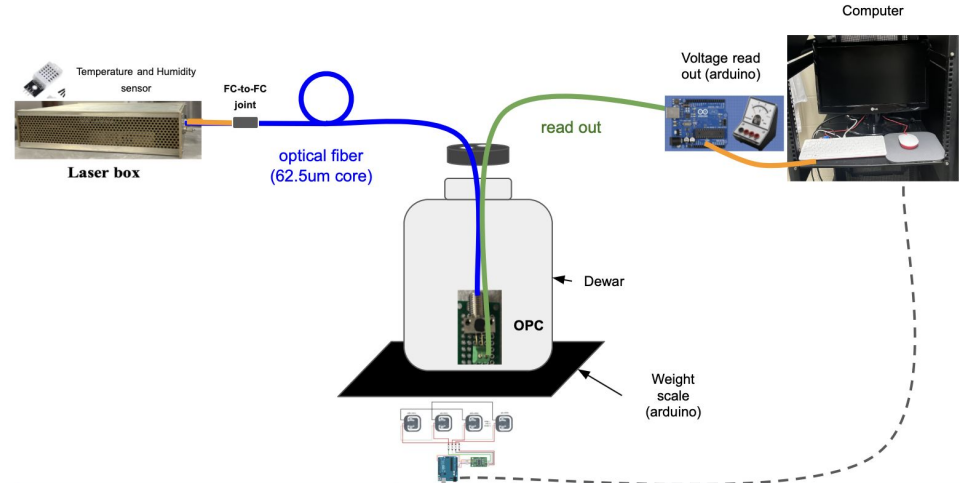
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## Preliminary design for monitor long-term voltage performance (PoF)

The preliminary long-term voltage monitor system for OPCs will consist of:

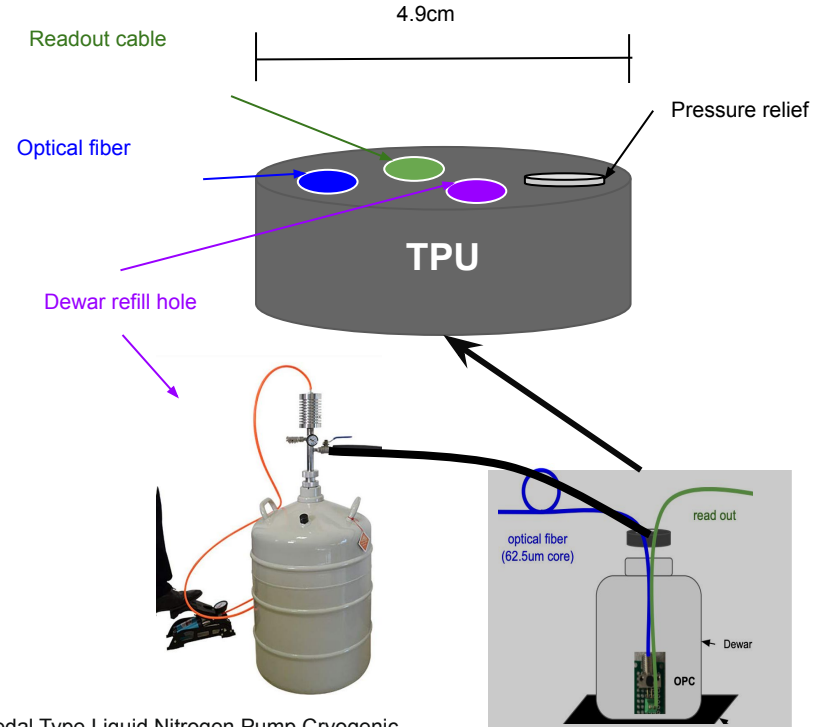
- One laser box unit
- One dewar of 10L
- One optical fiber of 62.5um core
- One OPC that will be connected to the laser unit through the fiber
- The OPC voltage output will be monitored by an arduino, which will be connected to raspberry pi
- LN2 volumen will be monitored by weight scale (currently method used in the thermal stress stand at SDSMT )



## Preliminary design for monitor long-term voltage performance (PoF)

The dewar lid will be designed and 3D printed in TPU. The design will have:

- Optical fiber
- Readout cable
- Pressure relief
- Dewar refill
  - Dewar will be refill with LN2 pump



Pedal Type Liquid Nitrogen Pump Cryogenic

## Preliminary design for monitor long-term voltage performance (PoF)

The laser box unit for long-term test will be installed in a rack. The rack will be equipped with:

- **One camera:** will allow to monitor the laser box unit
- **Smoke detector**
- **1U fan rack**
- **1U PDU**

smoke detector



1U rack fans



camera



1U PDU

## Plan

- **Dewar refill:**
  - LN2 evaporation rate will be estimated in the coming days
- **Our goal is start to take data on July:**
  - Materials could be order in the coming days
  - Voltage record for 2 hrs two times per week (longer times need to be evaluated)
- **Power input:** Provide 1W from laser box unit
  - **New laser box unit needed as soon as possible (62.5 um core)**
- **Under consideration:** Obtain IxV curves and OPC efficiency by load-resistor test using a maximum power input of 1W every 3-4 weeks

