Ionization laser updates (LIP)

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DUNE Ionization Laser Group Meeting

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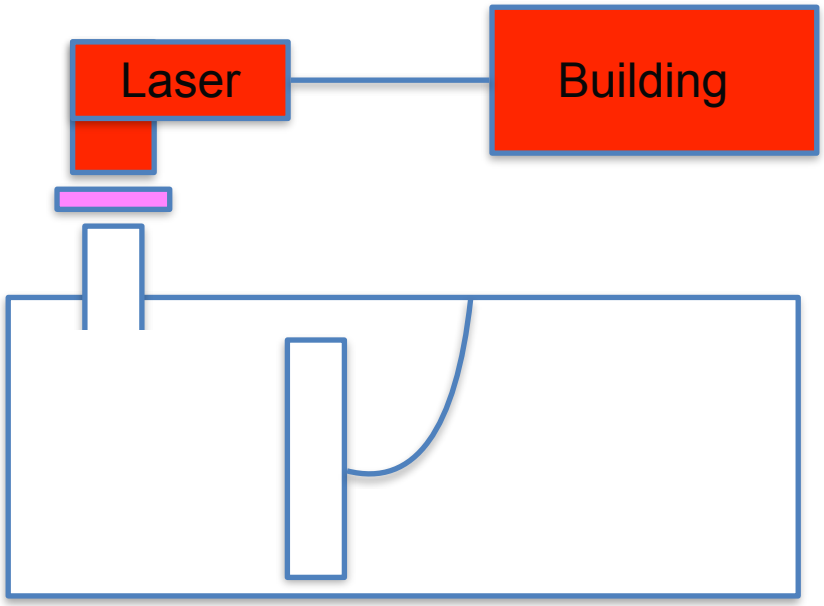
LIP LABORATÓRIO DE INSTRUMENTAÇÃO E FÍSICA EXPERIMENTAL DE PARTÍCULAS

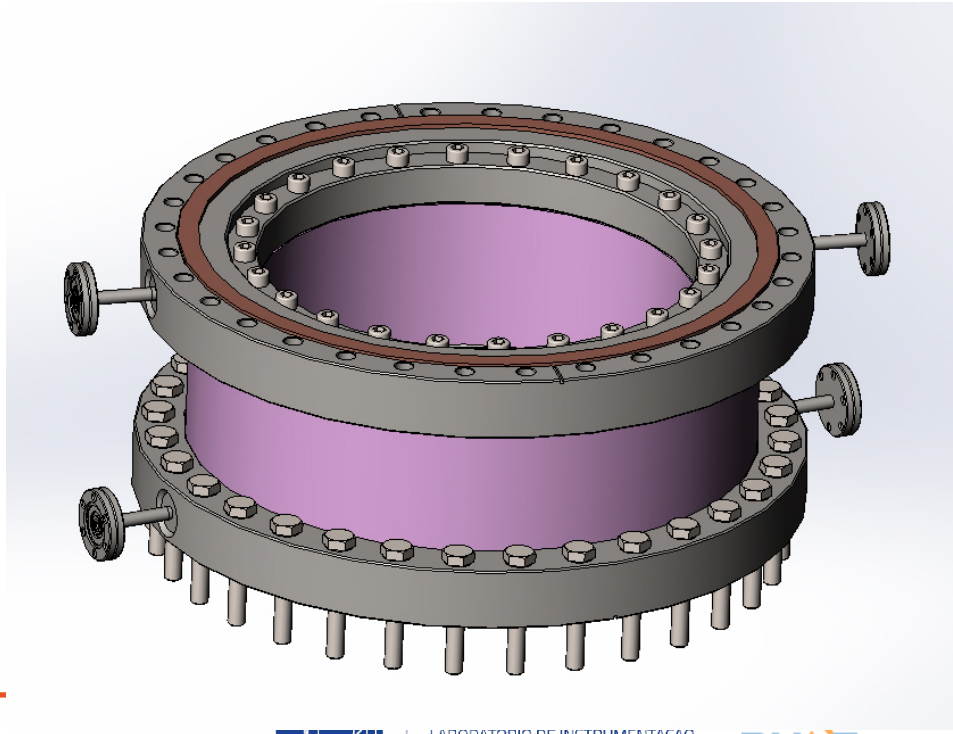
Ongoing work at LIP

- Port feedthrough design
  - insulation flange for both baseline and alternative
- LBLS mirror system
- Design of instrumentation interface board

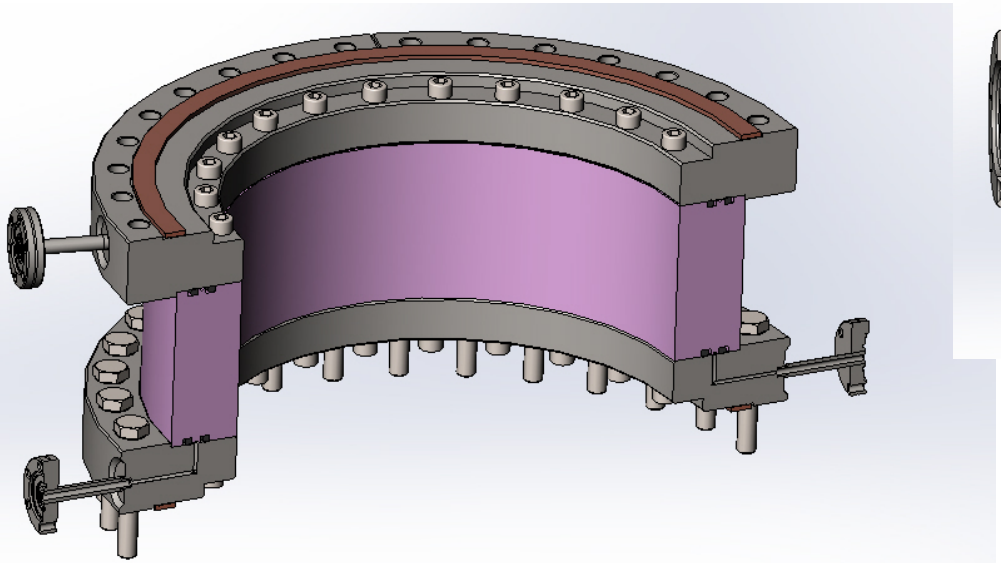
Port feedthrough

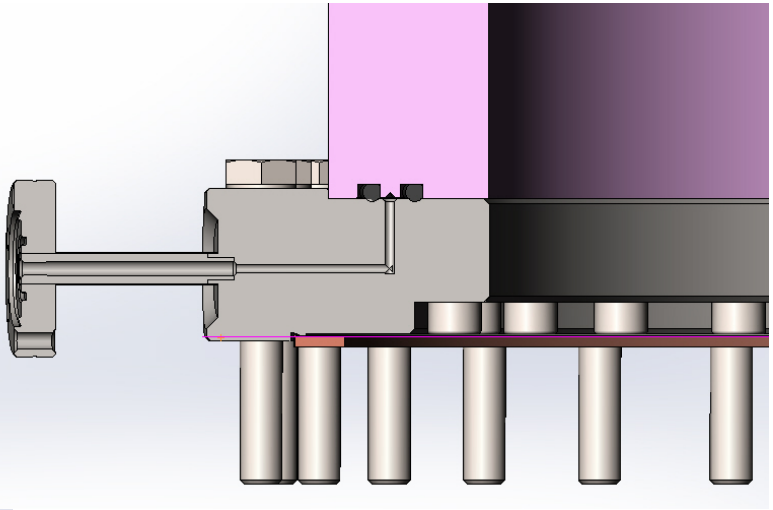


- To avoid electronic noise, need to insulate all laser system electrical instrumentation from the detector electronics
- Cryostat connected to detector ground. So: need an insulation piece on top of port, below everything else.



Port feedthrough





- The Proposal is to use POM (Delrin) as the insulator and SS for the flanges.
- We propose to use this in both the baseline and alternative designs.
- Any comments?

Link to CAD files

LBLS mirror ongoing work

- Detailed CAD by Rui Alves
  - Grab the FC profile by clamping the inner lips
  - mount 3 or 5 mirrors with minimal intrusion into volume
- Choice of positions/angles

Instrumentation

- What motors and encoders to use?
- Half-step motors are understood to be much more noisy.
- Single-step preferable?
  - Normal backlash: 0.35 deg. == 61 mm @ 10 m. Too much…
  - Anti-backlash motor option from Thermionics 0.018 deg/step
    - That's 3.1 mm @ 10 m. Should be good enough, as long as the precision of our knowledge is (just a bit) better than that
  - Can we trust only the knowledge of the step?
    - No. Motors can miss a step sometimes. Need encoder.
  - Big question:
    - Is it enough to have an encoder at the motor or do we need to have an encoder at the rotating flange?