

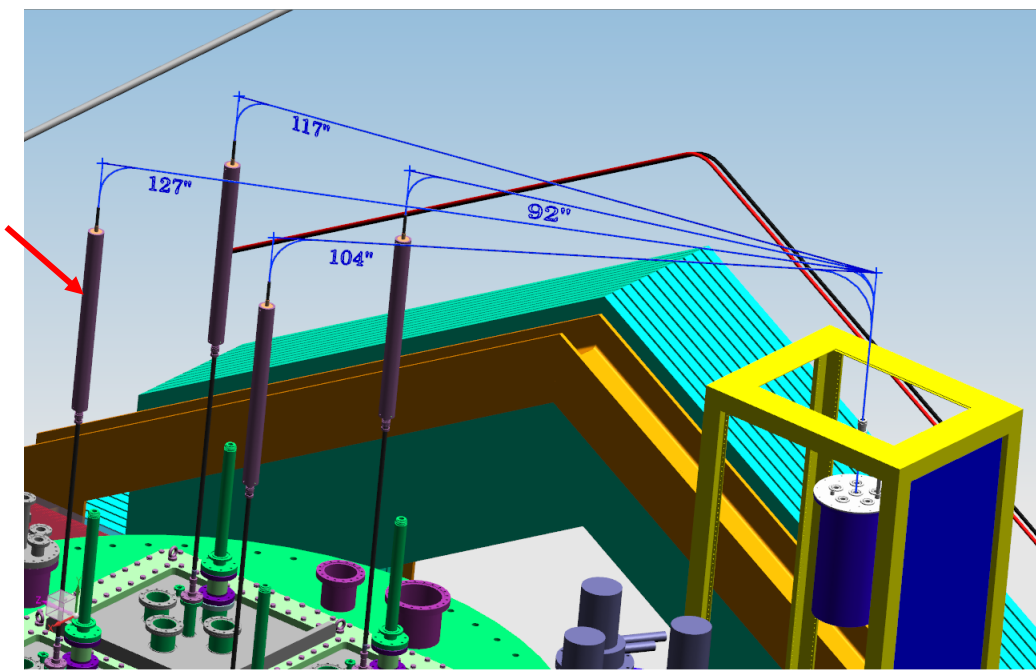
High-voltage cable routing

ArgonCube 2x2 Cryogenics Meeting on July 12, 2021

Gary Smith, Min Jeong Kim

Issues

- Fermilab team was asked to provide information on the length of high-voltage cable to be made for 2x2 tests (@LArTF and @MINOS). However, there was no design details available to answer that question.
- There have been several e-mail communications with SLAC & Bern teams.



Latest CAD model for High-voltage feedthrough and high-voltage filter box from collaborators

- Questions:
 - What's the red cylinder (marked with red arrow) above the flange?
 - How the cables must be connected to the filter box? Is this the cable that we are going to determine the length?
 - What are the limitations that we must be aware of to route cables? (e.g. cable bending radius, a preferred location of filter box, length limitation with cable, etc.)

Some answers

SK

Skarpaas, Knut <ksviii@slac.stanford.edu>

Mon 6/21/2021 7:51 PM

To: Min Jeong Kim; Andrew R. Lambert

Cc: Igor Kreslo <Igor.Kreslo@cern.ch>; Ting Miao; Francois Drielsma; Hirohisa Tanaka; Hulcher, Zach R. <zahulcher@slac.stanford.edu>; Ran Itay; Gary W Smith

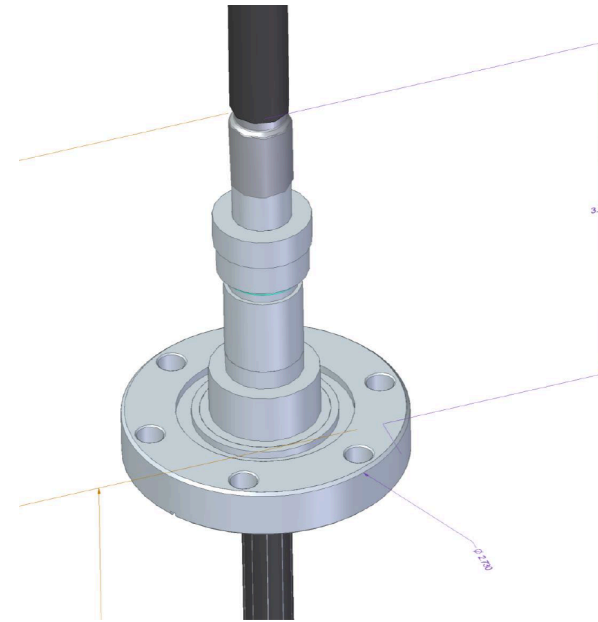


Hello-

The 24" long by 2" diameter cylinders will not be in your version. They are HV adapters which go from polymer cable to metal cable and get replaced by the terminations in the filter. This cable will go from above the Conflat to the filter without any interruptions. (The bend may start after the strain relief at the Conflat).

At SLAC, we just make one large arc from the Conflat to the filter. The reason for the 12" minimum bend radius is to keep the plastic inner shield (Layer 3) in contact with the insulation (Layer 2). When just a single braid is used, this can be tighter.

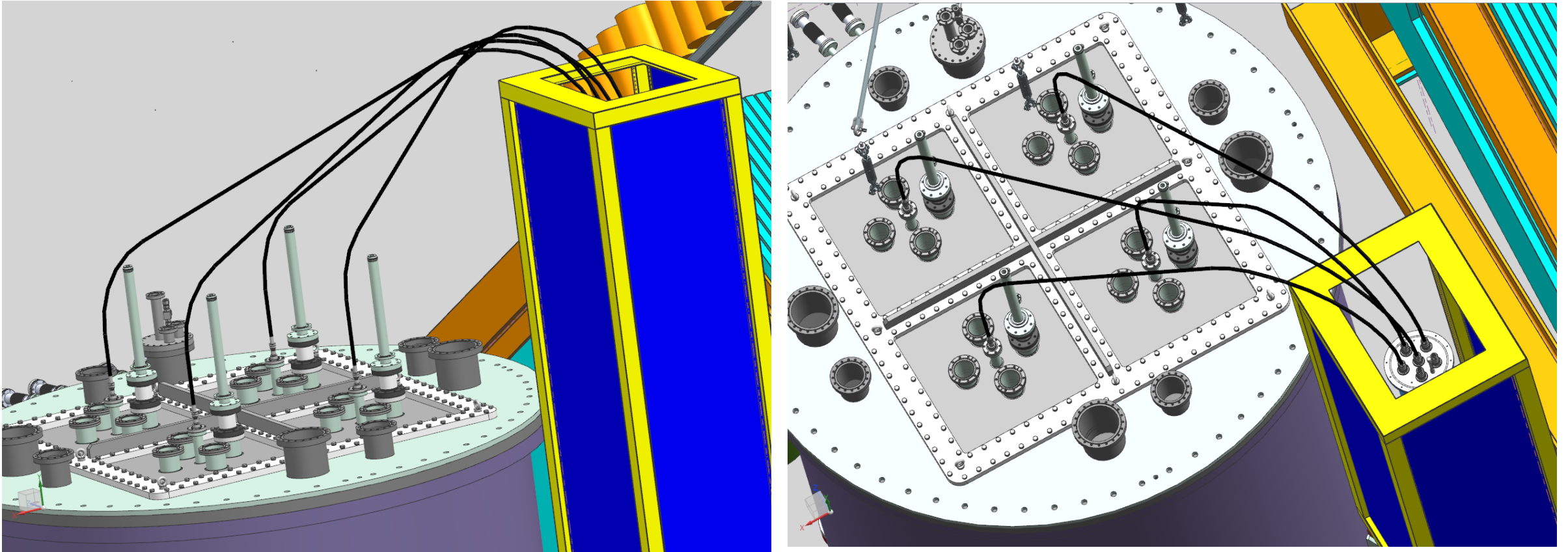
Knut



Shown is the HV feedthrough for Module Zero and ND
(It is a 2.75" Conflat flange with about 4" of compression tubes and strain reliefs above)
Please permit room for a gentle radius on the cable above this (12" radius should be fine above the rigid 4" section)

Proposed layout @MINOS

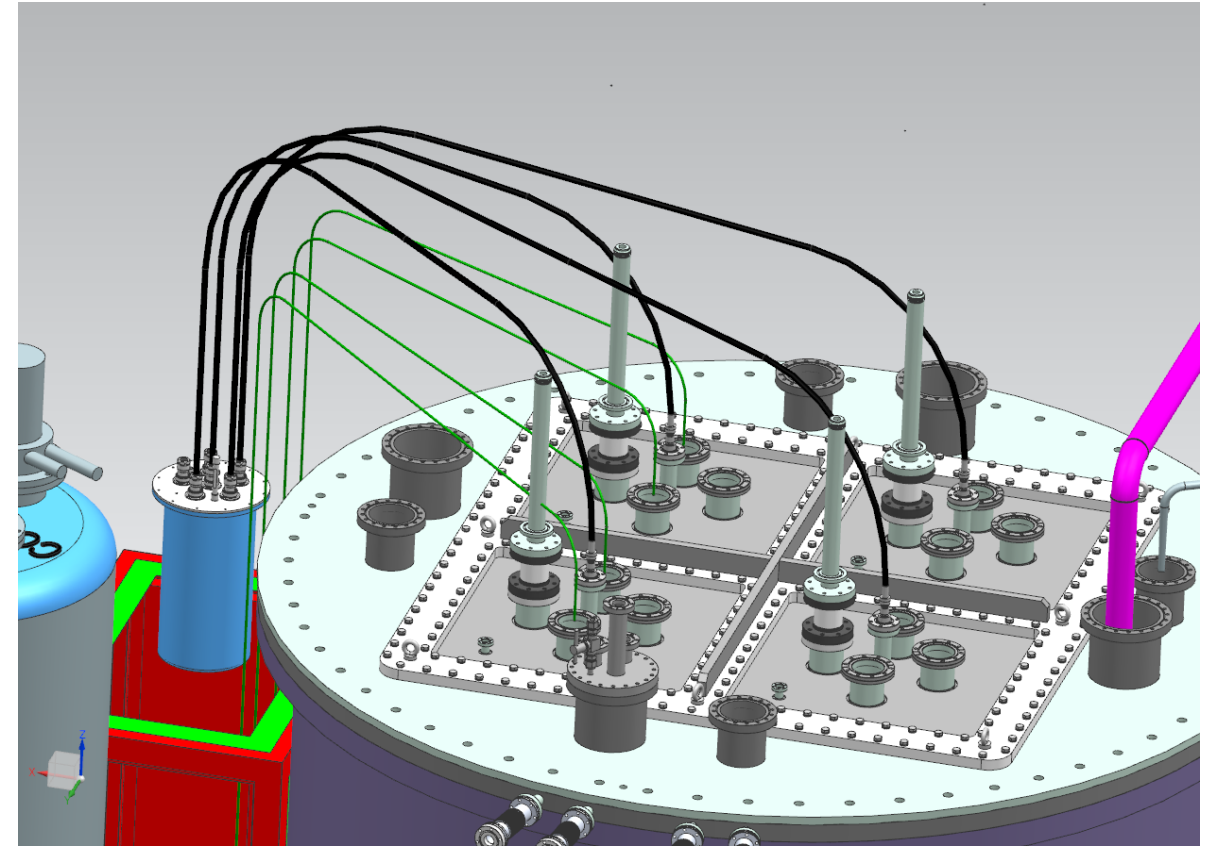
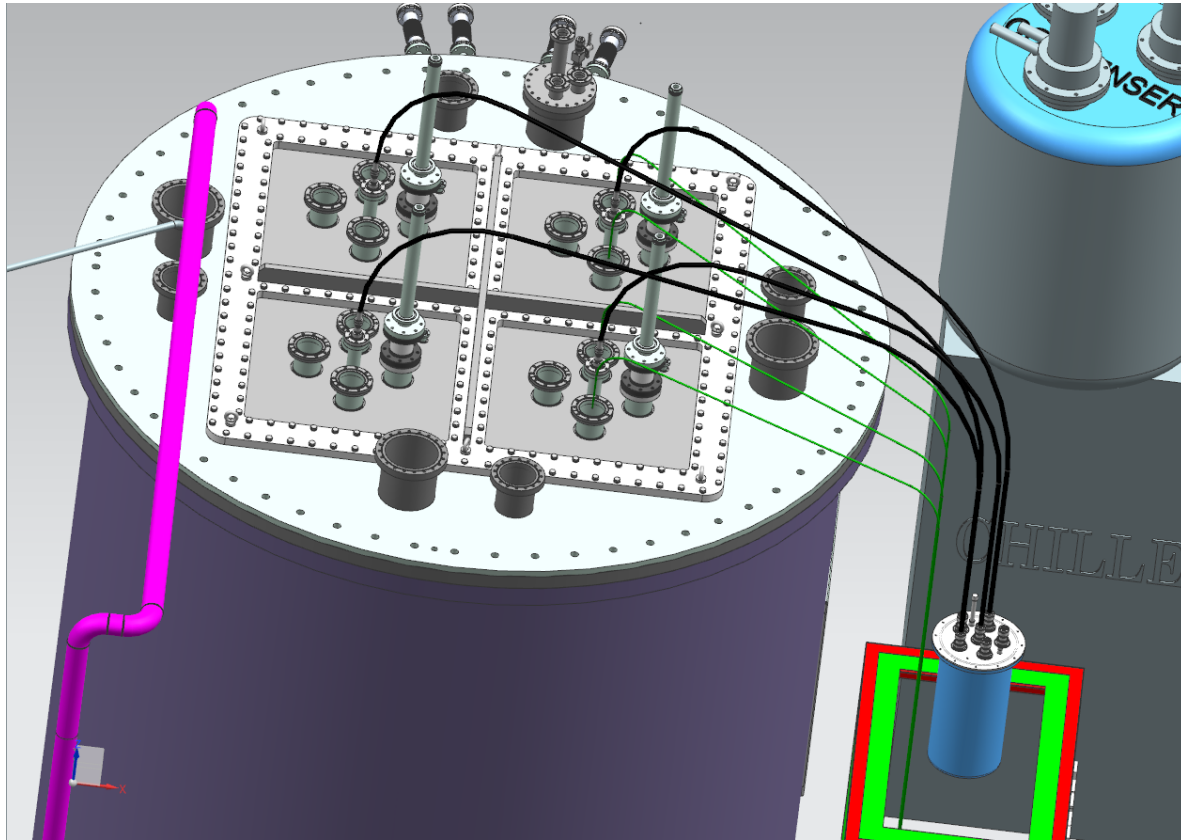
Weight of filter box: 30 kg (by Igor Kreslo)



Cable Length (Ordered by length): **127" (3226 mm)**, 118" (2998 mm), 108" (2744 mm), 97" (2464 mm)

Proposed layout @LArTF

Weight of filter box: 30 kg (by Igor Kreslo)



Cable Length (Ordered by length): 119" (3023 mm), 110" (2794 mm), 100" (2540 mm), 87" (2210 mm)

Summary

- We currently kept the high-voltage filter box inside the rack close to the cryostat. We can consider to move the filter box even closer to the cryostat if that is necessary by any reason.
- Should we cut cables right now for all feedthroughs? Or, can we plan differently?