Motivation

"To assess what element would fail first (beam screen + cooling channel, cold bore, SC cable….)."

"Quantify the likehood of quenching the busbar with beam."

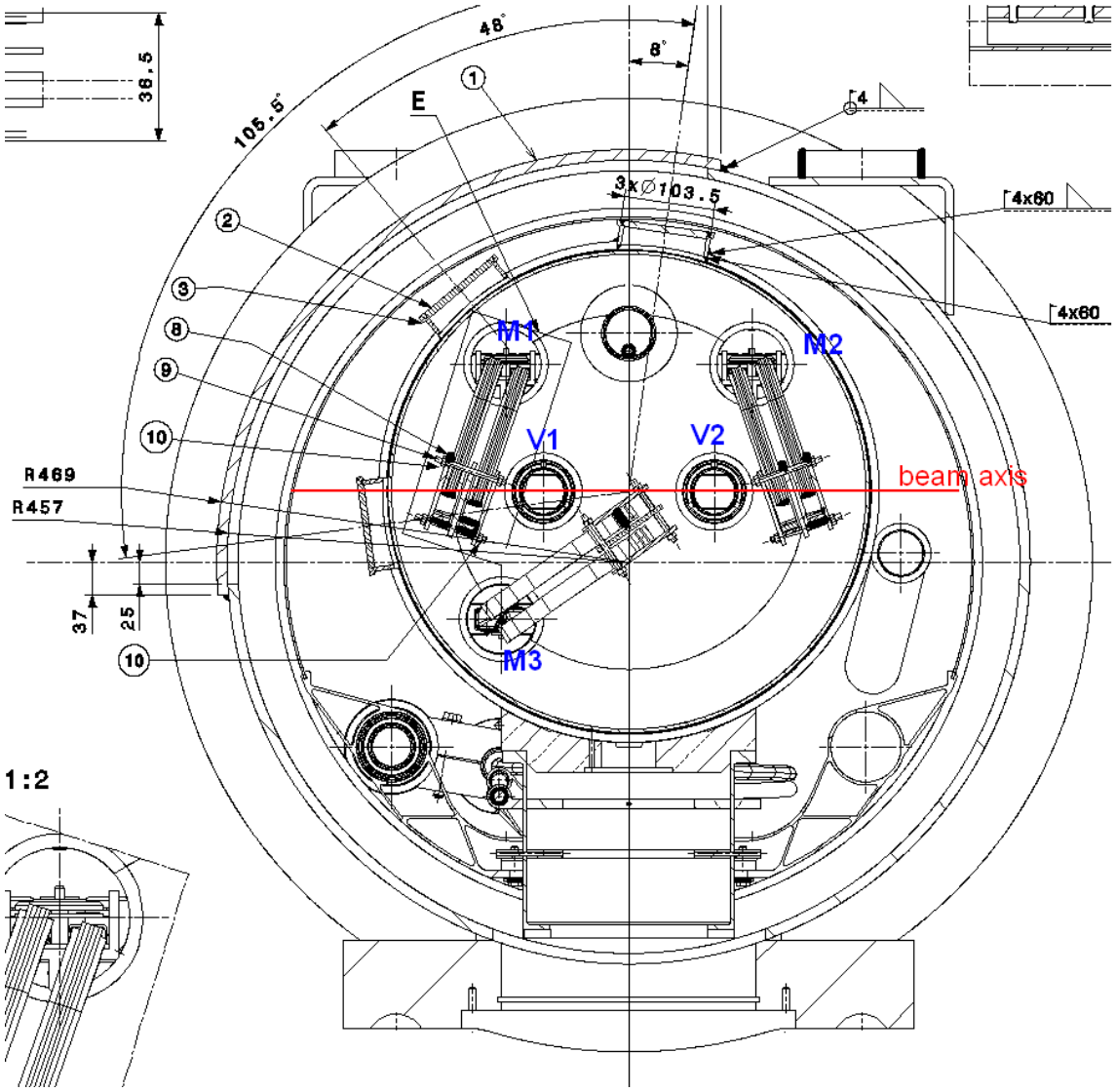
People involved: R. Appleby, M. Brugger, E. Lebbos, R. Schmidt, J. Wenninger.

Plans for Busbars simulations

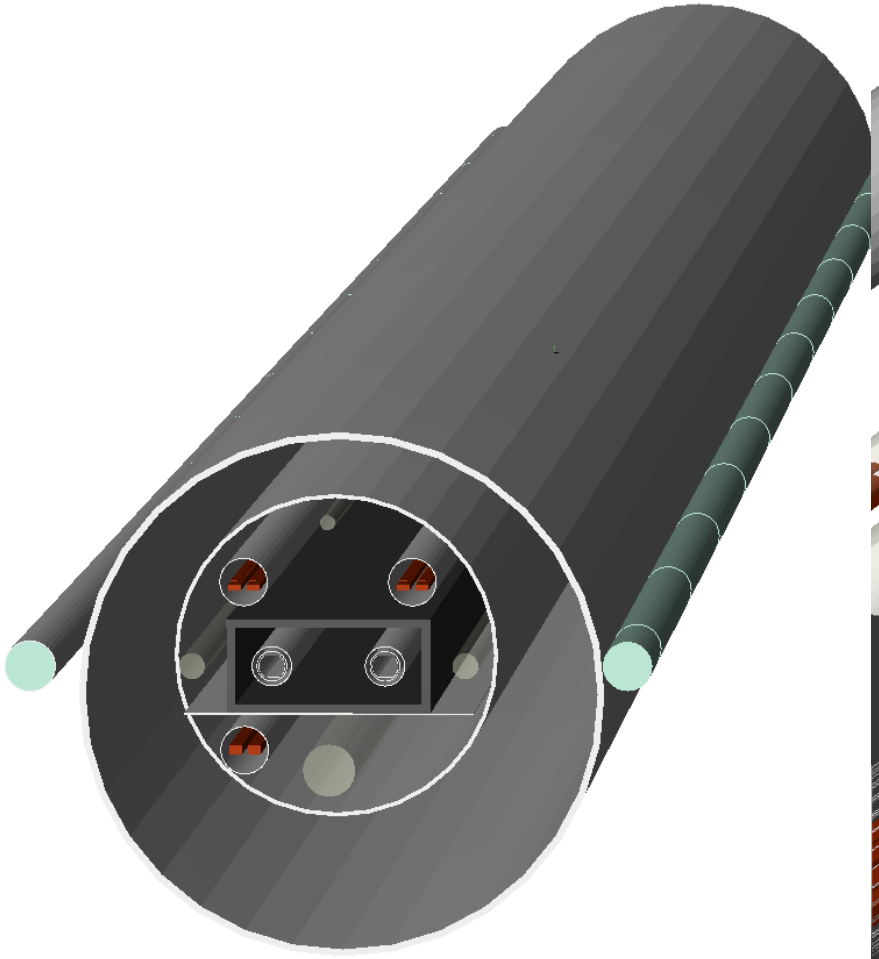
- Busbars interest cases
  - Interconnection
  - **Empty cryostat**
  - **DBF's**
- Simulate with Fluka different scenarios for each case
  - Location of the loss
  - Beam size effect
  - Beam impact angle

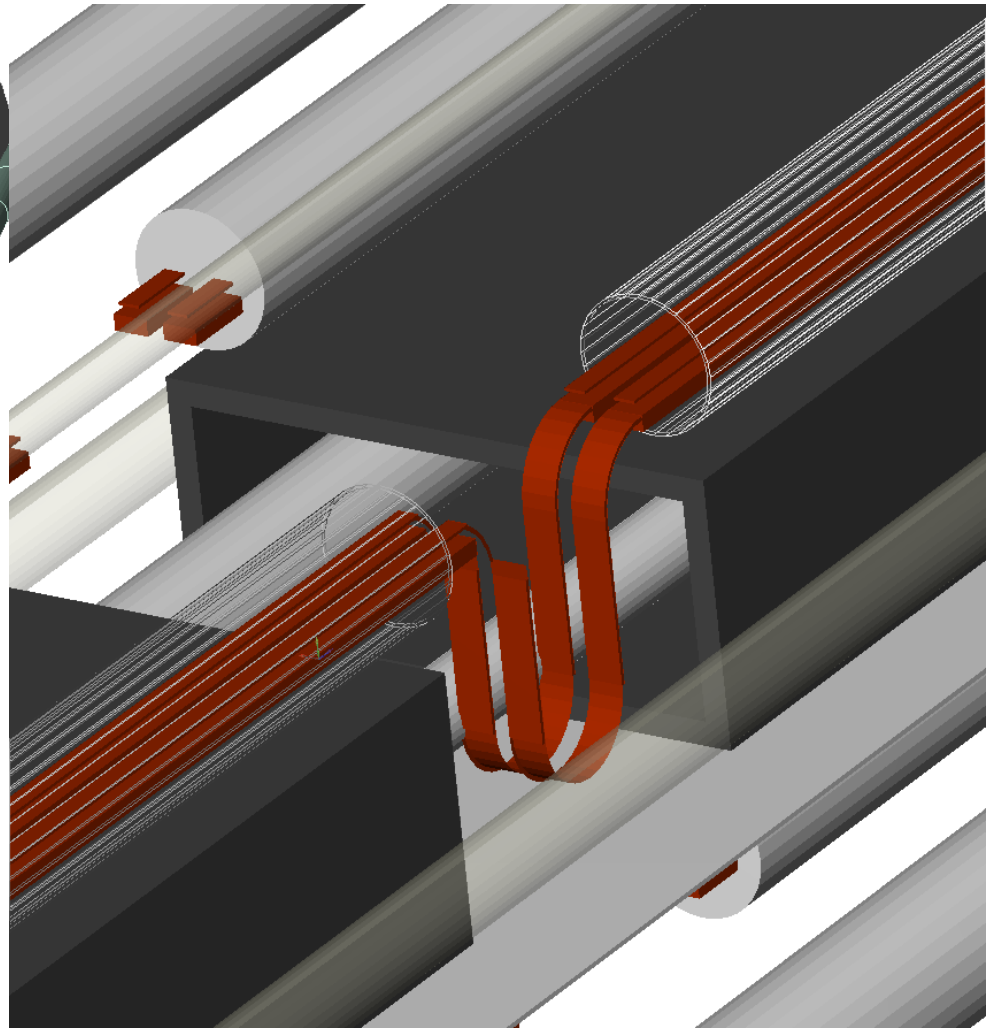
Empty Cryostat

- Use existing Fluka models of IR7
- Improve the model for the empty cryostat
- Simulate different impact scenarios on the previous quadrupole (*high β*)
- Score energy deposition on the busbar and lyra (*beam axis*).
- Score intensity on a virtual BLM



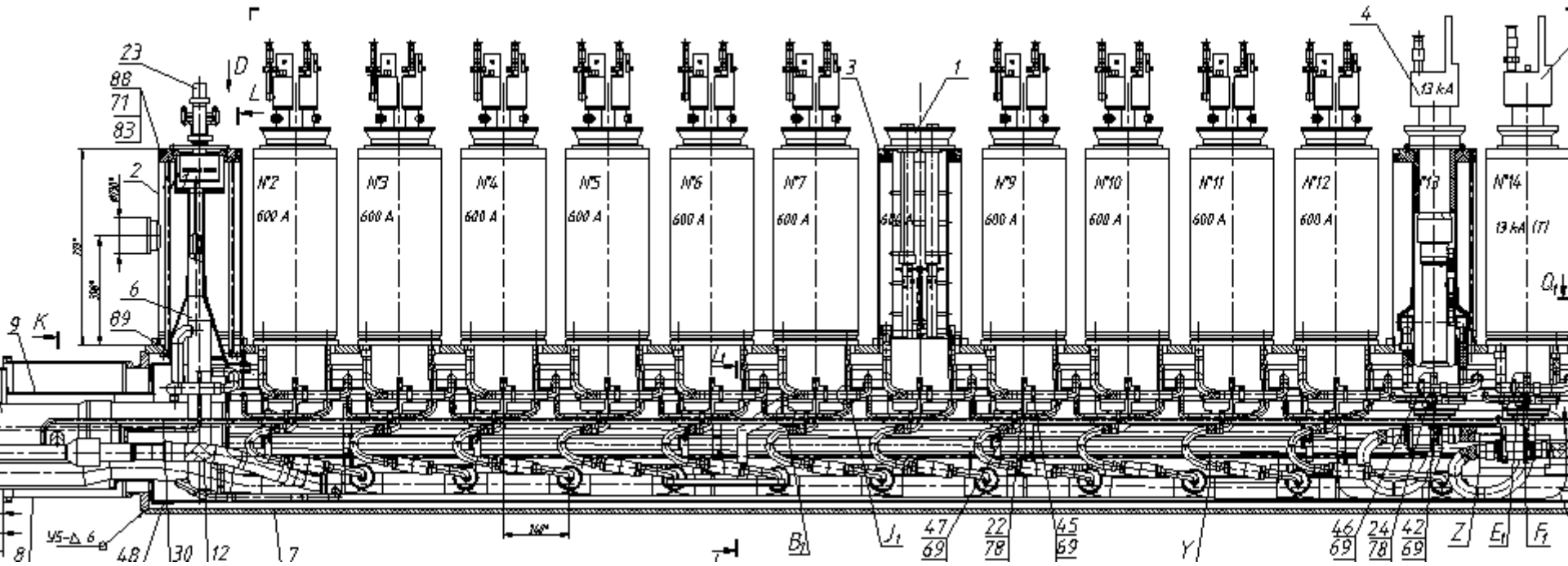
Empty Cryostat Model





DFB

- Busbars quite far from beam pipes.
- Impact on previous collimators (TCLA)
- DFB model complex



FIN

Busbars quench limits

- For I=10 kA.
  - Quench temp of the bus=7.6 K
  - Energy to warm up a s.c. cable from 1.9 to 7.6 K is 20 mJ/cm^3
  - Energy to warm up pure copper from 1.9 to 7.6 K is 8.4 mJ/cm^3
- For I=12 kA.
  - Quench temp of the bus=7.3 K
  - Energy to warm up a s.c. cable from 1.9 to 7.3 K is 17 mJ/cm^3
  - Energy to warm up pure copper from 1.9 to 7.3 K is 7.3 mJ/cm^3

(Arjan Verweij)

Empty Cryostat Layout