From the Meeting 1

Summary:

- ❑ 2 rooms under review: IP6 & IP8
- ❑ 3 configurations: 1,5T / Core / 3T
- ❑ 2 locations for the EMCAL: Inside or Outside the DIRC

Main questions for the mechanical part:

1. What kind of maintenance required?
2. How many parts for the detector? One or two parts?
3. Must we take out the detector?
4. Where are the “points” to fasten the detector? The Hadron calorimeter? The DIRC?
5. What is the keeping volume and the crystals configuration?
6. Where is located the detector? Inside or outside the DIRC?

A more completed design can start when the questions have been answered.
A prelimirary mechanical calculation for the structure is preferable.
A study (or prototype) for the cooling could be a good idea.

Responses

1. What kind of maintenance required?	**Outside the room, without the beam tube**
2. How many parts for the detector? One or two parts?	**One part**
3. Must we take out the detector?	**Yes**
4. Where are the “points” to fasten the detector?	**The DIRC**
6. Where is located the detector? Inside or outside the DIRC?	**Inside the DIRC**

5. What is the keeping volume and the crystals configuration?

Responses

ATHENA EEEMCAL:

z = -195cm
R_in = 11 cm (eta ~ -3.5) = R_min_PWO
R_max_PWO = 53cm (eta ~2) = R_min_Glass
R_max_total = 100 cm (eta ~ 1.4) = R_max_Glass

Modules PWO = ~ 2200 (2 x 2 x 20 cm3)
Modules Glass = ~ 1400 (4 x 4 x 40 cm3)
Total weight: ~ 2400 kg

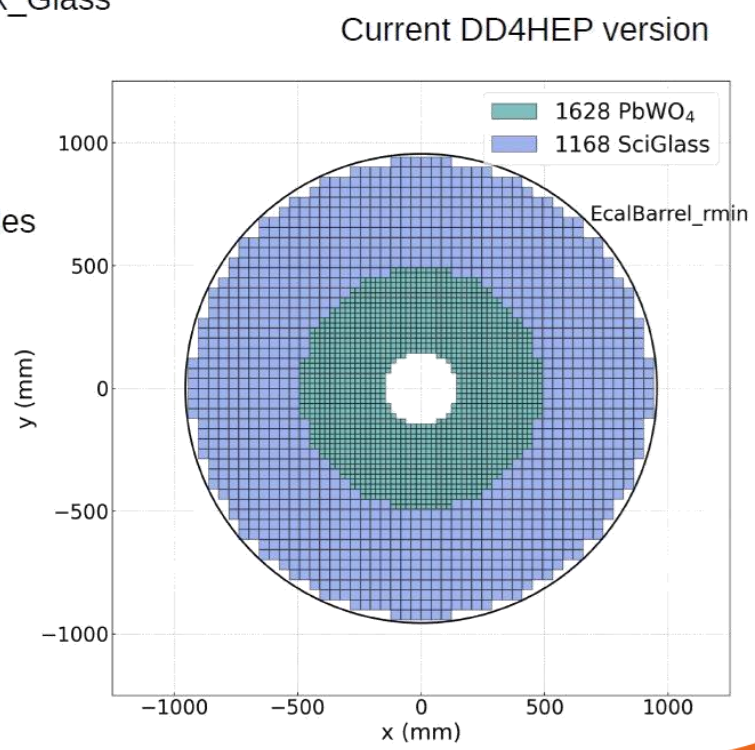
All PWO for this volume: 7600 PWO modules
Weight ~ 5000 kg

Cost estimates:

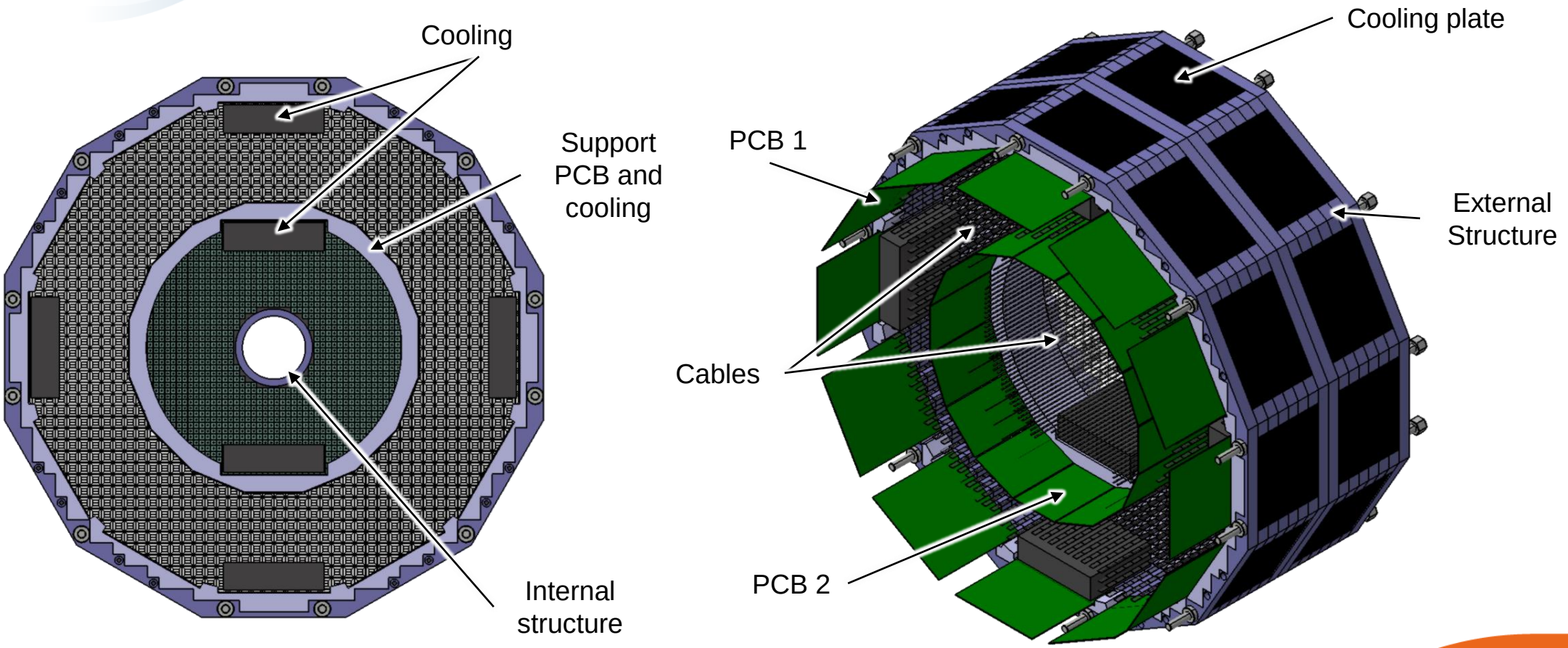
Hybrid ~6.5M$
All PWO ~14M$

Read-out ~1.5M$

Current DD4HEP version

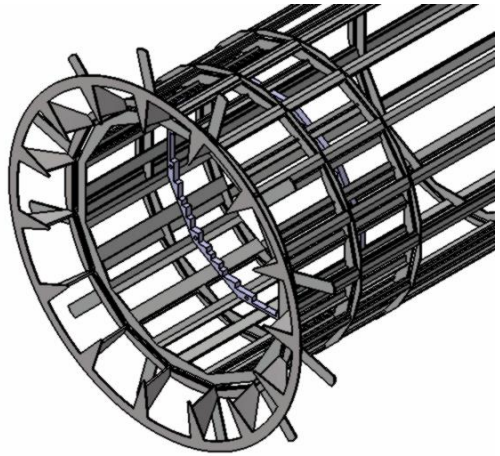


Mechanical design

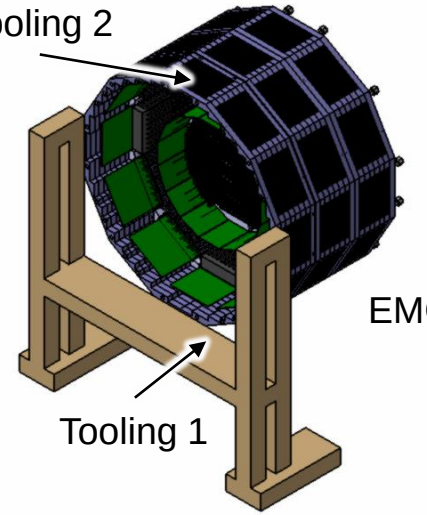


EMCAL fastened on the tool

Assembly

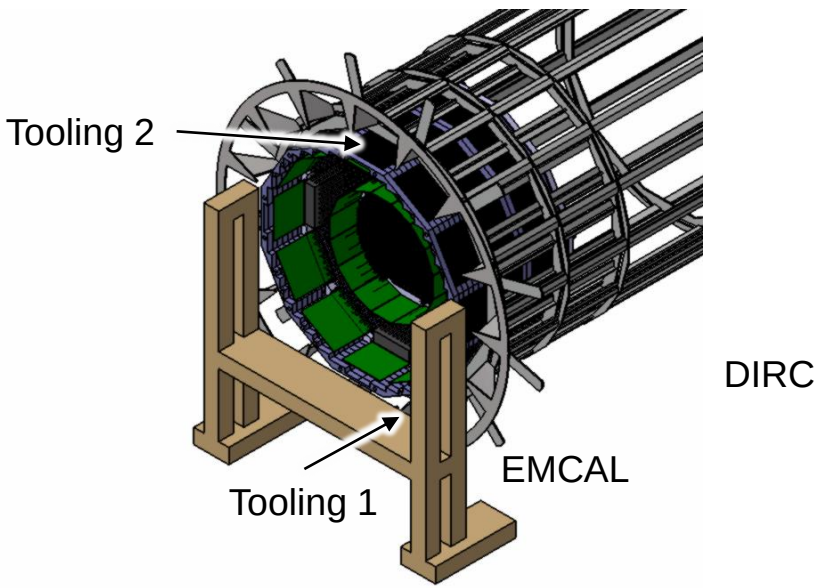


DIRC



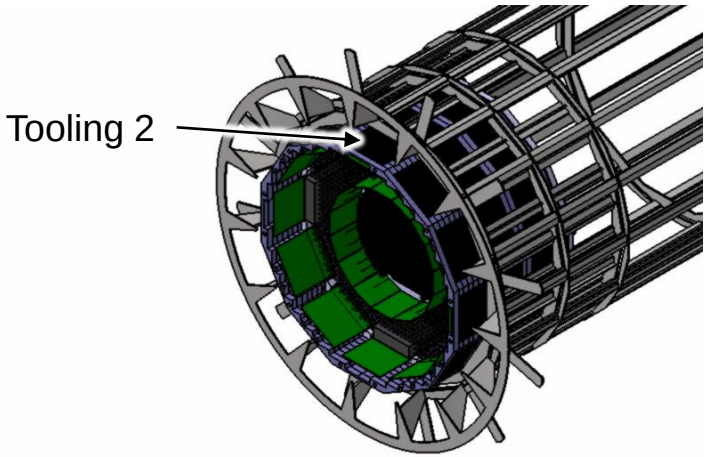
Sliding of the EMCAL into the DIRC with the tools

Assembly



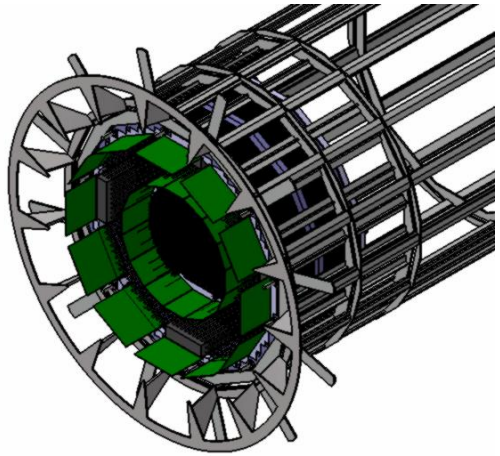
Fastening of the EMCAL on the DIRC and removing of the tool 1

Assembly



Removing of the tool 2

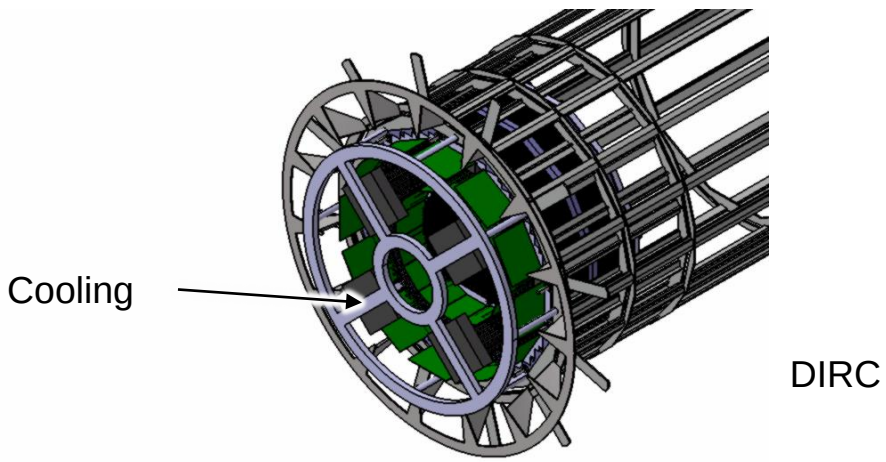
Assembly



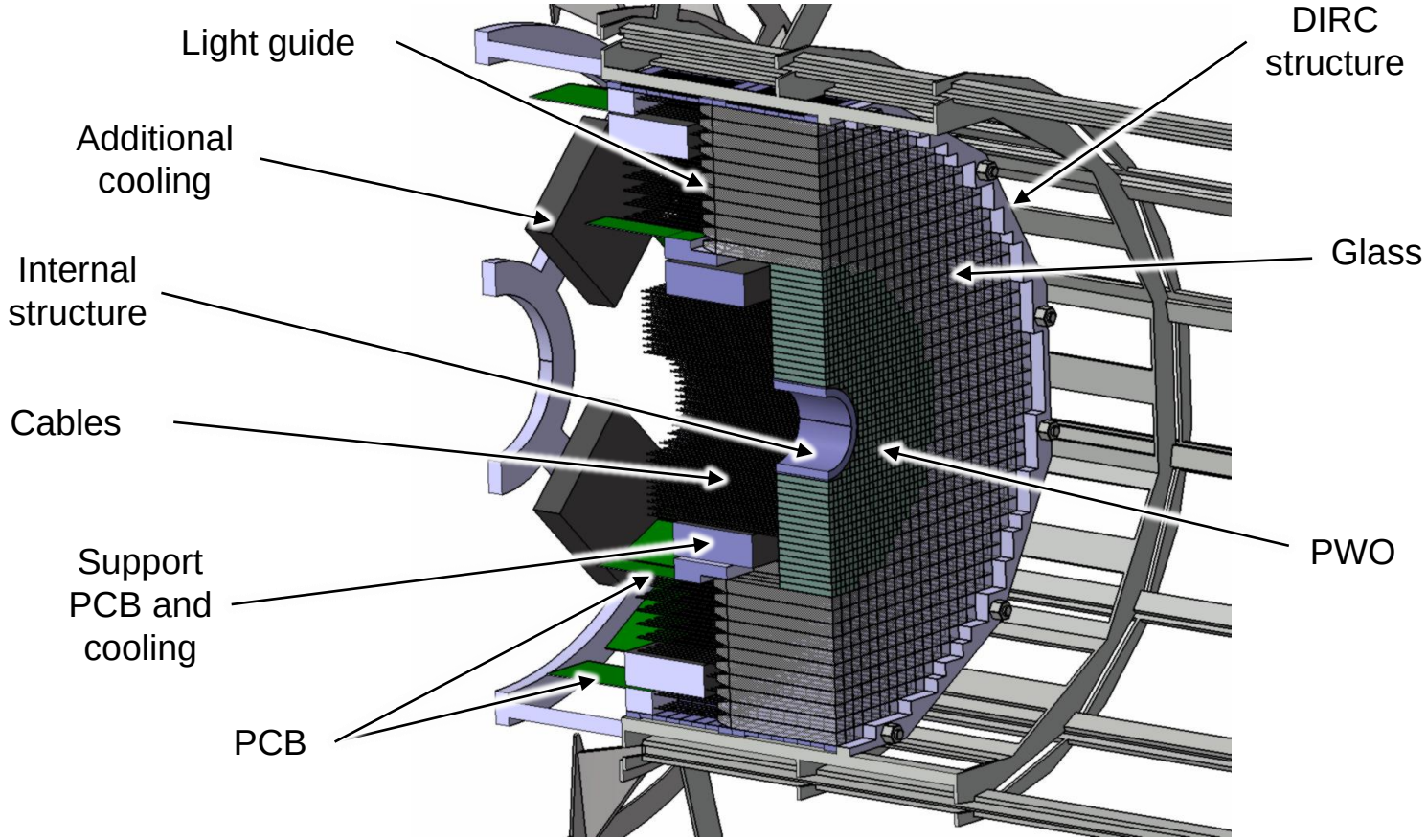
DIRC

Additional cooling

Assembly



Cut view


Light guide
Additional cooling
Internal structure
Cables
Support PCB and cooling
PCB
DIRC structure
Glass
PWO

Location of the cooling