
Minutes

EN/MME Meeting for HL-LHC CRAB CAVITIES

Monday, 23th February 2015

Room 112/4-C17

Scope: regular meeting for the HL-LHC CRAB CAVITIES (WP4) Project at EN/MME.

Attendees: Kurt Artoos, Ofelia Capatina, Teddy Capelli, Luca Dassa, Marco Garlasche, Norbert Kuder, Raphael Leuxe, Carlo Zanoni

DQW

The approval process is supposed to start soon.

- Kurt: 1st control.
- Ofelia: 2nd control.
- List of persons for the final approval.

There's still uncertainty on the final shape of the NbTi ring for the pick-up. A discussion with the workshop will be carried on (Action → Kurt, Raphael).

Helium Tank

Luca showed different scenarios of stress in the screws of the tank. These scenarios depend on the approach followed for dimensioning the bolts. Raphael highlighted that an increase from M5 to M8 would require a redesign of the interface of the plates. In summary, there are two approaches possible:

- i) The shear stress is taken over by the friction between the plates.
- ii) The shear stress is completely sustained by the screws.

In this second case, the configuration we use (one plate is threaded) would determine also a bending moment, which makes the stress in the screws high. In principle, the first approach would push toward a high preload in the bolts, the second toward a low one. A final decision shall be taken soon, after a review of the simulation results in view of the recent experience (Action → Luca, Norbert). Luca is also studying the standards on bolted connections and exploring the different types of Titanium screws available (Action → Luca). Titanium would be optimal for thermal contraction reasons. Ofelia remarked the importance of having small deformations where the weld for leak tightness are placed.

Luca also asked to clarify the complete set of load cases that have to be taken into account for analyzing the dressed cavity (Action → Luca).

As the geometry of the tank is mostly finalized, the 3D model shall be provided to our colleagues in UK (Action → Ofelia, Raphael).

HOM

Review of Marco's presentation in view of the "Crab Cavity HOM Coupler Design & Fabrication Review II" that is held at Jefferson Lab (USA) on the 25th. Marco, Rama and Teddy are attending in person and take the opportunity for further discussion with people with expertise on RF superconductive cavities there.

Cryomodule: Support System

Carlo summarized all the modal analyses run considering both the cavities and an interconnection. The highest 1st mode he was able to reach by qualitatively optimizing the position of the supporting rods is about 60 Hz. Unfortunately, this result is obtained with a 8 rods in a configuration that makes integration and alignment quite hard. The highest 1st mode with rods connected only with the top of the vacuum vessel (i.e. not with the sides) is about 35 Hz. A very stiff intercavity link was used. Carlo is exploring the possibility of using plates only on the sides of the He tanks. He's also retrieving information on the vibrational environment in which the cavities will stay - i.e. ground spectrum (Action → Carlo).

Next meeting: Monday the 2nd in room 376/1-020.

Minutes taken by Carlo.