

Minutes

EN/MME Meeting for HL-LHC CRAB CAVITIES

Monday, 15th June 2015

Room 376/1-020

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

Attendees: Alexandre Amorim Carvalho, Ofelia Capatina, Teddy Capelli, Federico Carra, Luca Dassa, Paula Freijedo Menendez, Stefanie Langeslag, Norbert Kuder, Giovanna Vandoni, Carlo Zanoni

RFD

Norbert showed the results of the first calculation of the RFD He tank. The final outcome will require some further calculation. Up to now, seems the bolts can sustain the load, although the margin factor is limited (the calculations are often worst-case, though). Once there's a rough confirmation of the strength of the tank, the cavity drawings will be officially issued. At the same time, it's also possible to proceed in reducing the tank mass as done for the DQW.

He tank tests: material

The Ti plates and discs needed for the He tank dummy will be ordered soon. Stefanie and Paula presented a list of the material and shapes needed. Part of the material will also be used for qualification. Up to now, there's no specification for Ti (could be that we take advantage of the current needs for producing one). Tensile tests at both 300 K and 2K will be performed. Luca asked if it's the case of performing also Charpy tests. The outcome of the discussion is that for our needs a tensile test at very high strain rate is probably sufficient. Also, the material available already will be tested ASAP in order to get a feedback on the goodness of the provider.

He tank tests: procedure

On the 11th of June there have been several discussions on the tests that will be performed on the He tank prototype. Frank Monnet (external company: 4030) proposed to use his test setup (supposed for leak tightness verification) also for the pressure test. It has been decided that the main reference for such a test will remain Didier Gonnard. Carlo and Luca will contact him in order to know the possibility of using gas instead of water. The possibility of performing

the test in this way without heavy safety constraints along with the control of leak tightness will be explored. In any case, the orientation is to proceed with the test under the supervision of Didier Gonnard.

Another discussion was focused on the cold test, which will be performed at the cryolab under the supervision of Torsten Koettig. The exact procedure and location will be decided by the team at the cryolab, once they have identified which cryostat can host the tank.

Magnetic Shield tests

The University of Zaragoza is not able to carry on the measurement of magnetic permeability for the shield in such high values. Moreover, it looks like the cause of decreased performance is the deformation (or a continuously applied stress, when in the elastic regime). The test procedure will take that into consideration and – if possible- correlate deformation with magnetic properties. The deformation can then be transformed into stress by means of tensile tests.

AOB

- The bolts for the first tests have reached CERN.
- Ofelia asked Paula (and Marco) to update on the status of the HOM fabrication during the next weekly meeting. Also, the RFD HOM fabrication should be now discussed and started.
- Bmax has finished the shaping Nb for SPL and the results are very promising. Crab cavities are the next step. Characterization of Nb would be greatly beneficial.

Deliverable for HL-LHC

Reminder. In the scope of the High Luminosity LHC a document on the cryomodule is required for the end of July. The following contributions have been foreseen:

1. Introduction: Ofelia
2. Dressed cavity: Luca, Norbert (with Carlo)
3. Tuner: Kurt
4. Thermal loads and performance: Fede
5. Support system and alignment monitoring: Carlo, Mateusz
6. Magnetic shielding: Nik, Thomas (STFC, UK)
7. Cryogenics: Teddy (with Ofelia)
8. RF: Rama (with Giovanna)

The single contributions should be ready for **July the 10th**.

Actions

- Finalize first iteration of RFD analyses → Norbert, Luca
- Minimize RFD He tank mass → Carlo, Luca, Norbert
- Give a feedback for starting RFD cavity drawings approval → Norbert, Luca
- Order material for DQW He tank prototype (+ another full model) → Paula
- Test on Ti available already → Stefanie
- Discuss the pressure test with Didier Gonnard → Carlo, Luca
- Discuss the possibility of performing magnetic tests at CERN and define a rough performance → Stefanie

Next meeting: Monday the 22th of June in room 376/1-020.

Minutes taken by Carlo.