CERN HL - LHC CRAB CAVITIES EN - MME

Minutes

EN/MME Meeting for HL-LHC CRAB CAVITIES

Monday, 12th January 2015

Room 376/1-020

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

Attendees: Kurt Artoos, Ofelia Capatina, Teddy Capelli, Federico Carra, Luca Dassa, Marco Garlasche, Norbert Kuder, Raphael Leuxe, Paula Freijedo Menendez, Carlo Zanoni

General

On Wednesday the 14th, Nik and Tom from UK are coming in order to discuss engineering details of the HOM and of the Magnetic Shielding. A meeting will be organized for the persons involved in such designs.

Next week, Luca and Paula are visiting Desy, near Hamburg, in order to discuss and learn how to deal with standards as well as some production hints for a large number of cavities. Desy is working on the European XFEL, which requires the fabrication of 800 elliptical cavities.

There is an alternative cavity concept, based on the ISOLDE know-how that allows sputtering Nb on bulk Cu. This idea can potentially have some advantages and should be further studied. As first point, the RF thermal load dissipation will be analysed (Action → Fede).

Helium Tank

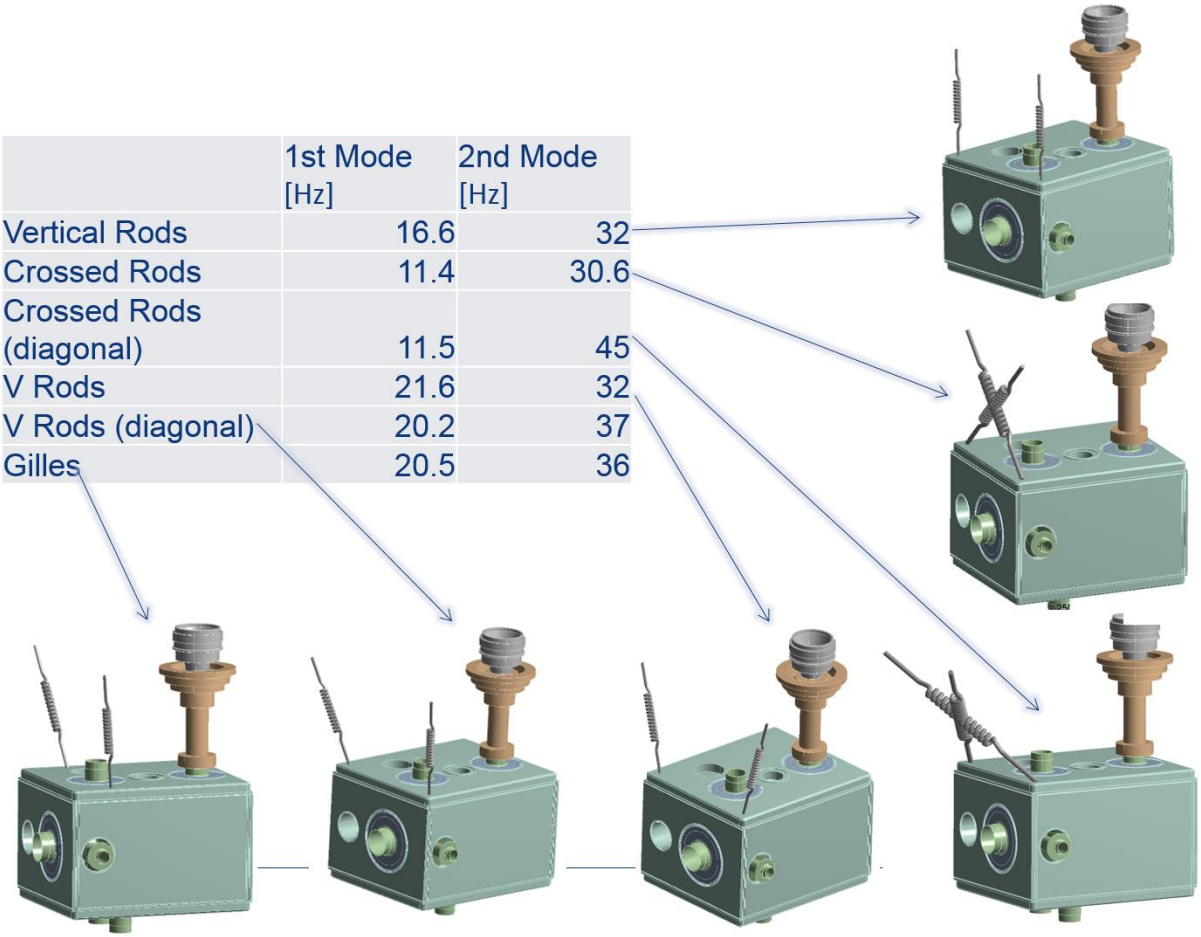
As far as the design is concerned, Raphael has finalized a first draft for analysis of the tank concept with screws. The concept with horizontal screws has been considered the most promising so far. The goodness of such a concept in terms of stress and deformation will now be assessed (Action → Norbert).

It has been emphasized that the final documentation on the He tank will be constituted by two reports (Action → Luca, Norbert): one on the actual final design and one keeping track of all the other concepts, in order to avoid repetitions in the future.

Carlo showed the results of his analysis of the vibrational performance of the He tank support system. Several concepts have been compared (see Figure). In principle, the best idea is to configure the supporting rods in a V shape. The X (cross) configuration produces a rotation point that further reduces the frequency of the 1st mode. In general, however, the

frequencies of the mode appear to be too low. Both a sensitivity analysis with respect to the rods' stiffness and an analysis of other potential ideas have to be performed (Action → Carlo).

	1st Mode [Hz]	2nd Mode [Hz]
Vertical Rods	16.6	32
Crossed Rods	11.4	30.6
Crossed Rods (diagonal)	11.5	45
V Rods	21.6	32
V Rods (diagonal)	20.2	37
Gilles	20.5	36



DQW

The drawings are finalized and ready for the approval process, which should start soon (Action → Rama, Raphael).

HOM

Carlo showed an update of the DQW HOM analyses. The use of bulk Nb (i.e. thicker) improves the performance in terms of stress and deformation. The most promising concept seems to be the one with the horizontal bellow. Increasing the load due to the HOM line is needed in order to have a full overview of the several designs (Action → Carlo).

The discussion on the fabrication of the HOM is going on.

Next meeting: Monday the 19th in room 376/1-020.

Minutes taken by Carlo.