Update on development of a novel measurement technique for the Amorphous Carbon EM Characterization in the Sub-THz frequency range (AP)

Andrea Passarelli presented his ongoing work on amorphous carbon (aC) electromagnetic characterization.

The goal is to study aC in the sub-THz frequency range. Amorphous carbon is a possible solution to mitigate electron cloud by reducing the surface SEY. The sub-THz range studied corresponds to an application to the CLIC damping rings.

To study the properties of aC, a coated copper foil was placed in an square waveguide. The structure without and with the copper foil was simulated in CST and the results were compared to analytical predictions.

AP remarked that in this case the waveguide + aC coated copper foil measurement will be compared to the waveguide + copper foil reference measurement.

NB asked if this set-up could be used for measurements in the GHz range: AP answered that the coating thickness and the set-up length would be impractical for these frequencies (several meter long).

SAnt and AP remarked that the resistivity measurement will be made on different samples of aC: important differences between the samples might exist.

Estimation of coating resistivity from TCSPM beam measurements (SAnt)

Sergey Antipov showed estimations of the Molybdenum, Molybdenum-Graphite and Titanium-Nitride coatings resistivity derived from beam measurements. He underlined that multiple assumptions are made on the beam parameters and the collimator geometries to obtain these values.

First estimations were made with the geometric impedance taken into account. Second estimations were made with the geometric contribution removed assuming that the CFC collimator (TCSG) and the three stripes collimator (TCSPM) have identical geometries.

For the Molybdenum stripe: a factor five in resistivity is found between the value used in simulations and the one derived from the beam measurements.

NB pointed that HL-LHC impedance simulations with this experimental value should be performed to assess the impact on beam stability and to compare it with previous simulations.

Update on TCSPM AC-DC resistivity measurements in laboratory (GM)

Giacomo Mazzacano presented an update on the laboratory AC and DC measurements of the TCSPM block.
DC resistivity measurement showed that the Molybdenum-Graphite blocks were not homogeneous. AC measurements were done to cross-check the DC results. The set-up was reproduced in ImpedanceWake2D for comparison. NB remarked that ImpedanceWake2D is not supposed to be able to simulate these three stripes as they have finite width.

In order to remove the effect of the block inhomogeneity, the Molybdenum-Graphite bulk was measured on the face without stripes.

The $\sigma$-meter measurements also showed the inhomogeneity of the block.

**AoB: status of interpretation of TCSPM wire measurements (NB)**

Nicolò Biancacci presented results of simulations made to understand the TCSPM wire measurements. These wire measurements performed on the TCSPM showed unexpected results: the Molybdenum-Graphite stripe had the highest resistivity of the three coatings (the Molybdenum coating is supposed to have the lowest resistivity).

CST simulations were performed applying on the wire an offset or an angle in the horizontal plane. The resistivity values are modified but the hierarchy between the stripes stays the same.

*Minutes written by: D. Amorim*