Outcome of recent Mo coating resistivity measurements

Adnan presents a comprehensive analysis of the eddy current testing applied to coating resistivity measurements. He first gives an introduction of the method and the procedure followed to characterize the Mo coated MoGr samples and blocks produced by CERN and two external companies, DTI and Politeknik, in view of the installation in the HL-LHC collimators. The method presents a good agreement when measuring on an Al sample. Adnan addresses as well the method reproducibility versus the instrument integration time. It is found that slower integration time is more prone to drift than a fast, but less accurate, one. Adnan analyzes the effect of the geometry on an available copper block of the impedance lab. He divides the surface into a matrix and applies the measurement method on each point: a region of bad conductivity is present and shown on a 2D resistivity map.

Adnan measures the CERN block with 4 and 8 loops coils. The coating behaviour is present and visible from the peak in resistive impedance: scaling by the maximum of the absolute impedance gives a resistivity close to the nominal value of 52 nOhm.m.

The DTI small sample is as well showing the coating peak and resistivity is below nominal.

The Politeknik manufactured sample does not show the coating behaviour and it is therefore assumed not to be compatible with requirements.

Difficulties have been encountered when measuring thicker blocks, probably due to internal non homogeneity which is difficult to be disentangled.

F.Carra wonders how the outcome of the measurement could be on the real 20mm thick blocks. F.Caspers comments that a thin 6um film on Cu/Al has the best contrast at 1 GHz. The eddy current testing is very critical on distance and contrast between bulk and layer resistivity. He questions on the use of the method itself and would propose to take a different approach going higher in frequency (resonant cavity).

B.Salvant asks by when an answer needs to be provided. It is by the end of next week to give the green light to the firms.

C.Zannini comments that at higher frequency also the roughness will play a role and caution is needed.

How to find dipolar and quadrupolar impedances of an asymmetric cavity by using eigenmode simulations

Sergey Arsenyev presents a new way to find the driving a quadrupolar shunt impedance in an asymmetric cavity using the Eigenmode solver. Steps for the conventional approach to deduce the driving impedance are summarized. A further expansion of the longitudinal
shunt impedance over the driving and test positions using a square root functional relation, allows to deduce the quadrupolar impedance. Sergey shows successful benchmark between the analytical, CST eigenmode and wakefield solutions.

C.Zannini comments that a symmetric structure has only driving impedance, therefore it does not represent a general case, as also addressed by Sergey.

J.Mitchell will apply the theory for the most relevant modes in crab cavities. For the moment they were relying on wakefield simulations.

N.Mounet will need to look into the implementation of quadrupolar modes in DELPHI Vlasov solver.

F.Caspers comments that a perfect symmetric structure never exists and small coupling loop perturb the symmetry and need to be taken into account if needed, with accurate simulations. B.Salvant wonders if this is new. It seems Sergey could not find anything similar in literature so far.

A.Chmielinska will try to apply the method on the MKI as it is difficult in Wakefield solver.

CLEAR test facility

Antonio Gilardi presents the environment of his PhD topic: the CLEAR test facility. The facility can be useful in order to measure the impedance induced kicks on a travelling electron bunch. Other studies are as well possible involving THz radiation and plasmas.

K.Sjobaek comments that in the future a second beam line will give more space for experiments. The involved bunch lengths are in the order of few ps and it is possible to get longer/shorter bunches.

N.Biancacci wonders if this could be interesting for PT100 studies.

B.Salvant informs that there is interest from the BI group in order to try and study the wirescanner impedance.

Beam coupling impedance of the PSB extraction kicker and its effect on transverse stability

Carlo Zannini summarizes the effect of termination cables on a kicker. Different impedance patterns are visible once the termination load is changed. Past work from C.Carli has been further confirmed by recent MD studies done by E.K.Platia and Carlo. The occurrence of the instability is compatible with the mismatched impedance of the PSB kicker. The MD of 12/11/2018 proved the relation between PSB horizontal instability and kicker terminations. The instability completely disappeared with matched kicker termination on the generator side.

S.Antipov wonders if the tune can be adapted: Carlo comments that it is possible but there is reluctance on being limited on the working point choice.

E.K.Platia comments that at present the damper can suppress the instability but in the future the injection energy will be higher and the damper is blind the first few ms after injection.

The most interesting solution would be to work on the impedance source.

Minutes written by Nicolò