Impedance meeting
15 February 2016

Presents: M.Beck (MB), N.Biancacci (NB), E.Bonanno (EB), L.Carver (LC), F.Caspers (FC), A.Danisi (AD), A.Grudiev (AG), T. Kaltenbacher, (TK) F.Paciolla (FB), T.L.Rijoff (TR), B.Salvant (BS), A.Valimaa, (AV),
The slides can be found at https://indico.cern.ch/event/496817/.

TDI impedance measurements update (NB):

NB presents a summary of the TDI measurements done in 2014, 2015 and 2016 on overall 5 TDIs. In 2014 the TDI8 was measured before LHC run. The measurements suffered systematic displacement, but no sign of spoiled coating was suspected. After 2015 run TDI8 is in worst coating conditions than TDI2. The new TDIs foreseen for installation (Cu+Ti coated) look fine from the impedance point of view.

NB shows comparison of beam power loss measurements and the same parameter inferred by longitudinal impedance measurements. NB wonders why TDI8 is not well on spot like TDI2, he suspects the HOM that have lower $R_s$ in wire measurements. AG suspects instead that either the measurements is within the errorbar (should add to the plot), or the broad band impedance is under-estimated. This especially hold since the tune shift comparisons match quite well for chroma units of 10.

AG comments on the gating procedure: it lowers Q of high frequency resonances kind of averaging the contributions of the high frequency modes, it does not filter them out. FC agrees.

Proposal for a setup for TDI blocks measurements (IG):

NB presents a setup he would like to build for measuring the 72 HbN blocks that will come. FC suggests to do simulations before, in order to assess the range of $m$dB we are going to explore.

AG comments that we should be careful to the resonances of the box itself. NB comments they are high in frequency ($\simeq 800$ MHz).

Offline discussion with FC suggests to perform DC resistivity measurements on the surface of the HbN blocks as a first simple measurement.

Goniometer: update on measurements and simulations (AD):

AD presents a wrap-up of measurements on the crystal collimation goniometer. Two modes were detected at 680MHz and 800MHz but only the first could be found in CST simulations. The device complexity and the crystal material properties unknowns are complicating the process and probably affecting the results in important way.

AD tried to excite the goniometer modes selecting only TM excitation. AG and FC agree that TE should be also included as the beam is not exciting only TM. Moreover TE modes are usually at lower frequencies than TM.

AD presents Q measurements. For FC the values are too high and the stainless steel
conductivity should be re-checked. A mode could not be coupled: FC suggests to let
the probe inner conductor stick in by 2-3 cm to enhance the coupling. FC comments
that the device is not safe for operation with high beam intensity: 1 W is a limit and
would burn the Si crystal. FC suggests to dope a little bit the Si to gain conductivity:
this would help and should be taken into account by designers. Issue with static charge.
Moreover, as AG comments if too much field goes in the Si, the parameters of Si itself
will change.
To simplify model and measurements, AG suggests to remove the Si crystal and measure
again: this of course, if it is possible. AG suggests also to simulate the model when
moving the holder: do we have the same effect as in measurements?

**Outline of TWICE-2 (BS):**

BS presents the main outline of TWICE workshop (more to come with Christine in the
next meetings).

- **IW2D** is a standard now and we should now think on upgrades like implementing
  frequency dependent material properties.

- **ECHO3D**: do we use it? Are we interested in it? Are there bench problems that
cannot be solved wit CST or HFSS? AG suggests that we should identify problems
  that we cannot solve in CST/GdFdL.

- **BS** shows an interesting concept of bellow shielding with interdigital structure for
  light sources.

- **BS** shows a measurement of rise time vs CB mode number mode.

- Impedance localization has been tried in ALBA with success, based on phase ad-
  vance versus intensity measurements.