Impedance meeting  
15 March 2019

Presents:  
D.Amorim (DA), S.Antipov (SAnt), S.Arsenyev (SArs), N.Biancacci (NB), O.Bjorkqvist (OB), E.Carideo (EC), F.Caspers (FC), R.Illan Fiastre (RI), E.Métral (EM), M.Migliorati (MM), B.Salvant (BS), L.Teofili (LT), C.Zannini (CZ).

The slides can be found at https://indico.cern.ch/event/806178/.

Upgrade and modification proposal on existing impedance measurement tools (collimator flanges, probes, H011 cavity) (RIF)

Ricardo presents the possible modifications of the collimator flange used to hold and sweep the wire in impedance measurements. There are now lateral motors to push/pull the wire transverse position. Screws are still present in case the motors would not work. NB suggests to make the right one longer in order to cover the full span. RIF suggests a pressing mechanism based on 4 rotating pins playing on the tolerances. NB comments the idea is nice but, with time, we risk to dig a hole on the copper plate, as it has been observed on the present equipment. The contact pressure is crucial, to ensure that no field leaks out: a clamping mechanism could grant a better distributed pressure along the plate. FC recommends to make a small epaulement of 0.1, 0.2 mm on the plate in order to make a defined contact. RIF presents a structure to hold a longitudinal motor in order to pull the wire. FC comments that a little pulley could do the job, or a tuned spring. RIF will study solutions either with a spring, or with a motor in lateral position. FC reminds that a Cu bronze wire could be used when stretching the wire as it is stronger. Moreover the resistor can be placed laterally on the soft wire taking care of avoiding wire to stick out (no more than 5 mm) as it can become a notch filter. FC suggests to replace the Cu plate by brass (0.2 µm gold plated on the contacts) which is the RF material. NB invites OB to think to possible applications/modifications for measurements to be done on the MKI case.

RIF presents the scaled H011 cavity to be produced to measure the 20x20mm samples. FC recommends to use SMA connectors fixed on a flat surface. There are 352-type ones with flat end available on Huber-Suhner catalog. FC reminds that the probes pins should be replaced by little loops: this ensures better coupling with the H011 mode and less cross coupling between probes, than in the case of two straight pins. Also, the transverse relative position should be as large as possible ( probe should be put as high as possible and the other as low as possible).

NB presents on behalf of Francesco Di Lorenzo the improved probes. These are more solid, the markings are slightly etched at every centimeters and the soldering ensured very good contact. FC reminds when soldering stainless steel to be careful to remove the oxide layer by using a liquid remover.
Impedance studies of single-side collimators (EC)

Emanuela presents her work on the estimation of geometric and resistive wall impedance on single side collimators. FC comments that the geometry now reminds a single wire on top of a lossy plate. EC presents the comparison of the impedance computation done sweeping the beam transverse position from the jaw: the impedance exhibits now a constant term and a stronger quadratic term than in the case of the symmetric jaws impedance. BS asks about the other plane and the quadrupolar impedance. SAnt comments this has to be checked and included in the analysis. SAnt comments as well that there are no meaningful higher order terms above the second one. Overall there is a clear reduction of linear terms (dipolar impedance) while the impact of higher order terms needs to be quantified with macroparticle simulations.

AoB

EM informs that Thibaut Lefevre reported a high heat load in the AWAKE line. To be quantified the amount of power and the frequency range (it seems to be above 10 GHz).

NB reports on the magnetization of the TDIS flange: after welding a slight magnetization has been found on the stainless steel. This is not a surprise nor an issue from impedance point of view as it leads to a small increase of surface impedance ($\sqrt{\mu_r}$). Nevertheless it would be interesting to measure the permeability values. BS reminds that, on top of this, an additional NEG coating is done on the surface.

Minutes written by: N.Biancacci and D.Amorim