

Impedance considerations for the new TDIS parking

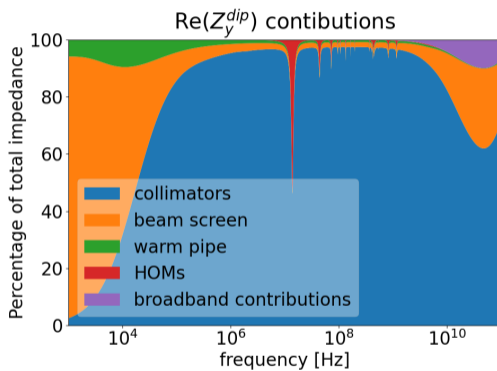
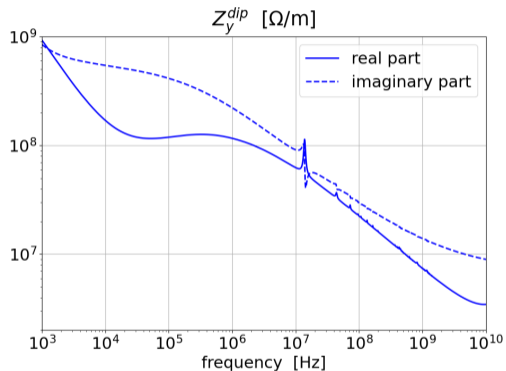
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Many thanks: L. Sito, E. de la Fuente Garcia, B. Salvant, C. Vollinger

LHC collimator impedance

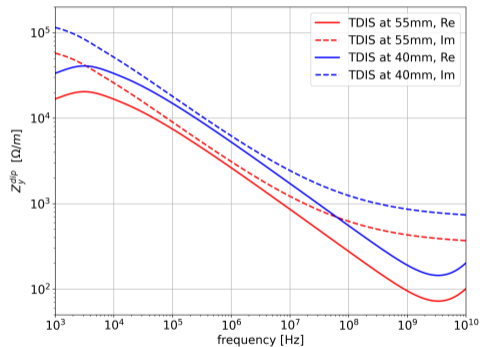
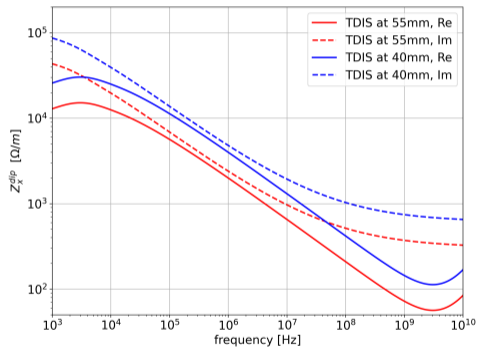
At flat-top, the collimators are the largest impedance contributor (up to 90% of the total impedance)



Any change to the collimation system must be evaluated carefully, in order to avoid increasing significantly the total impedance.

TDIS transverse impedance at 40 mm

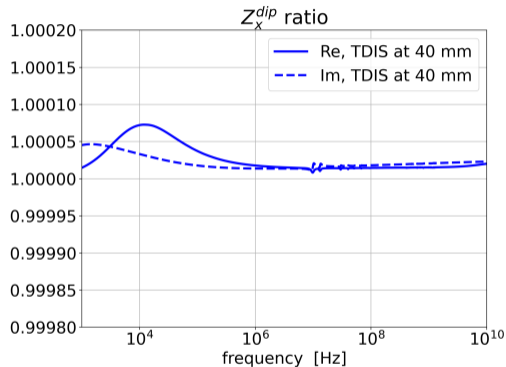
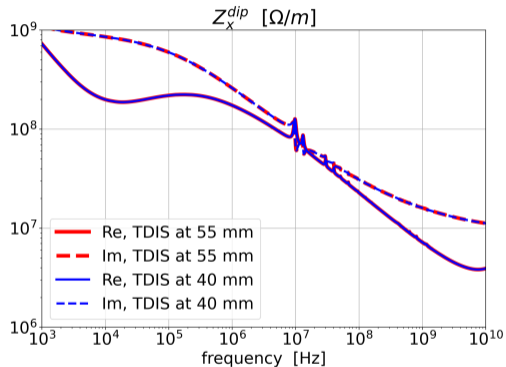
We evaluate the impedance increase when decreasing the TDIS parking position from 55 mm to 40 mm.



The TDIS impedance increases by a factor ~ 2.5 .

Impact on the total transverse impedance model

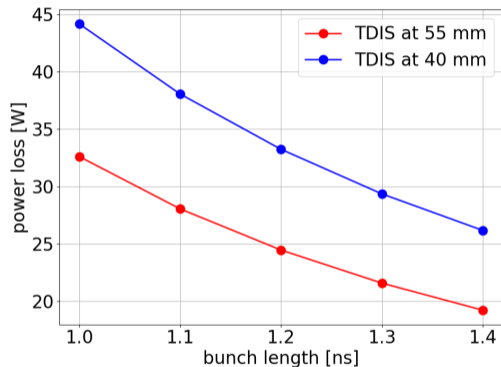
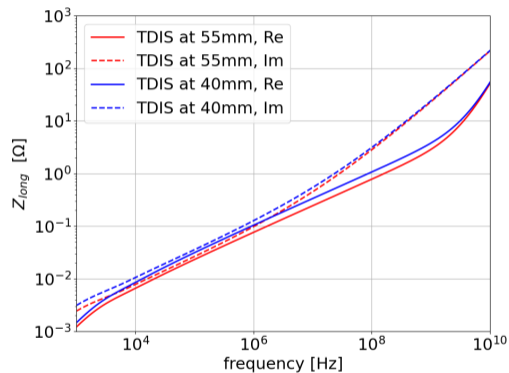
We check the total impedance increase with the tighter parking position.



- ▶ Similar results in y
- ▶ The impedance increase is small (at the scale of the full model) because the TDIS impedance remains low with respect to the other collimators.

Beam-induced heating

It is also important to check that the beam-induced heating does not become critical when lowering the parking halfgap. The power loss calculations are performed with BIHC.



- ▶ Longitudinal impedance and power loss increase by a factor ~ 1.4 .
- ▶ The power loss calculations are consistent with bench measurements