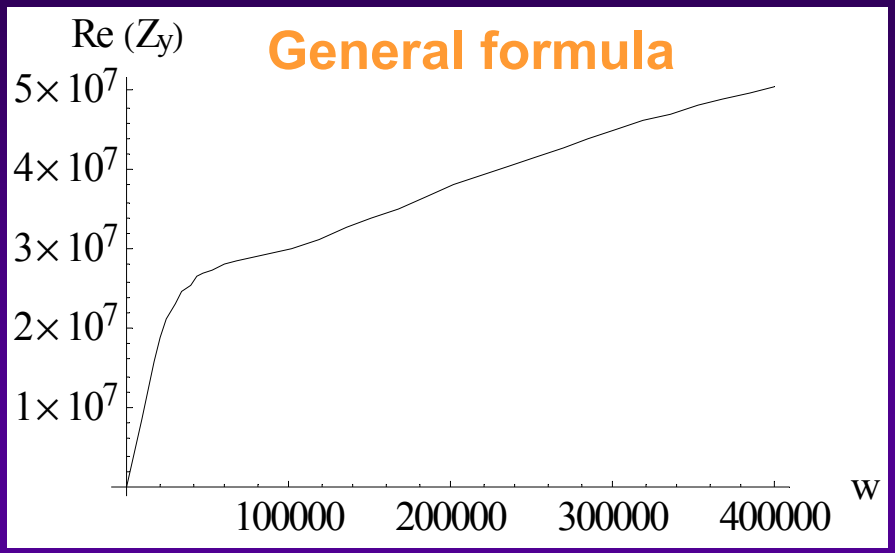
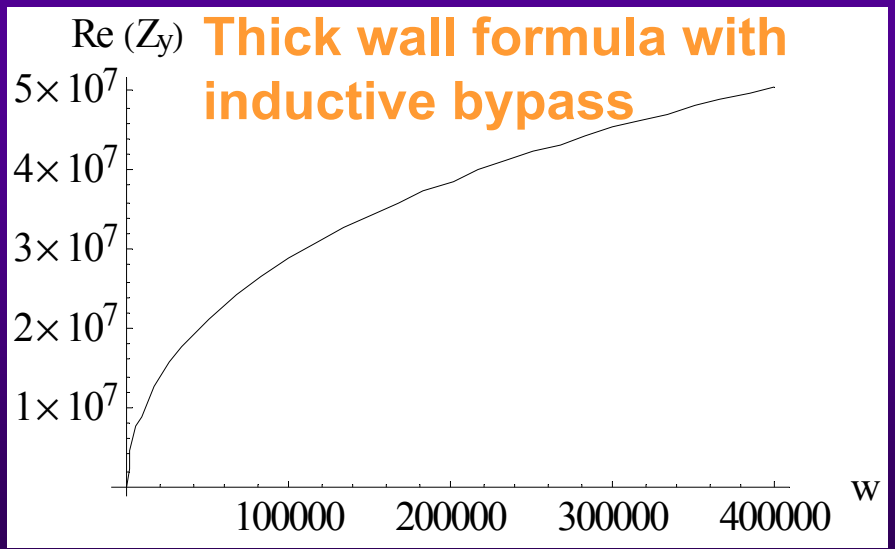
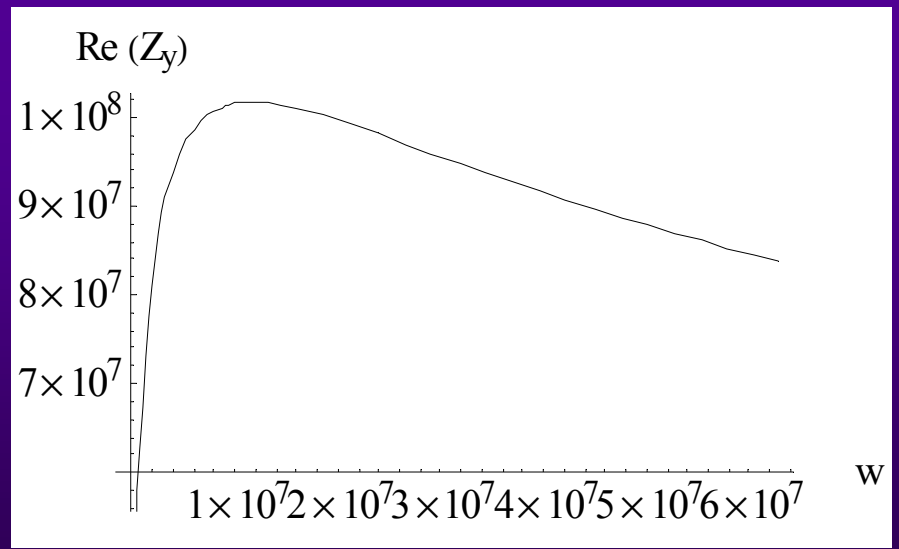
LHC COLLIMATOR IMPEDANCE : COMPARISON BETWEEN THE NEW GENERAL FORMULA AND THE THICK WALL FORMULA WITH INDUCTIVE BYPASS (which was used until now)

E. Metral

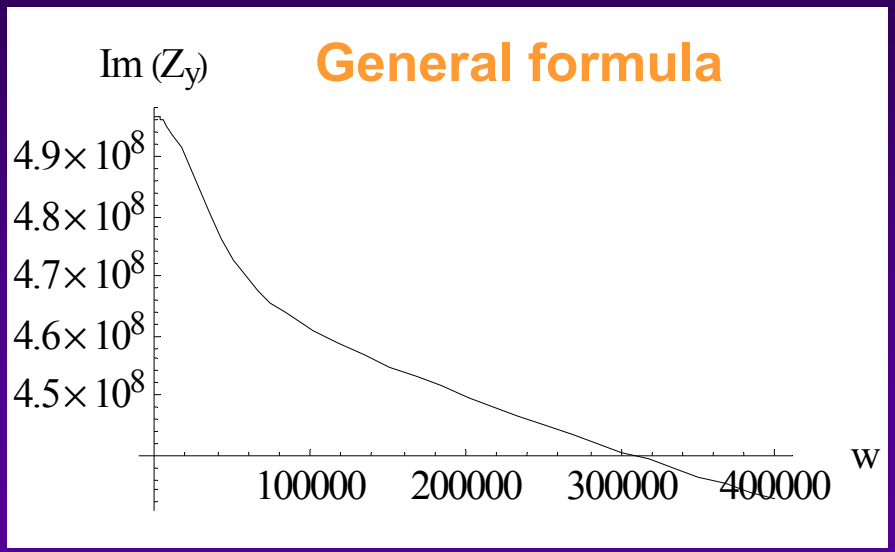
Plot of the total vertical impedance (1/2)

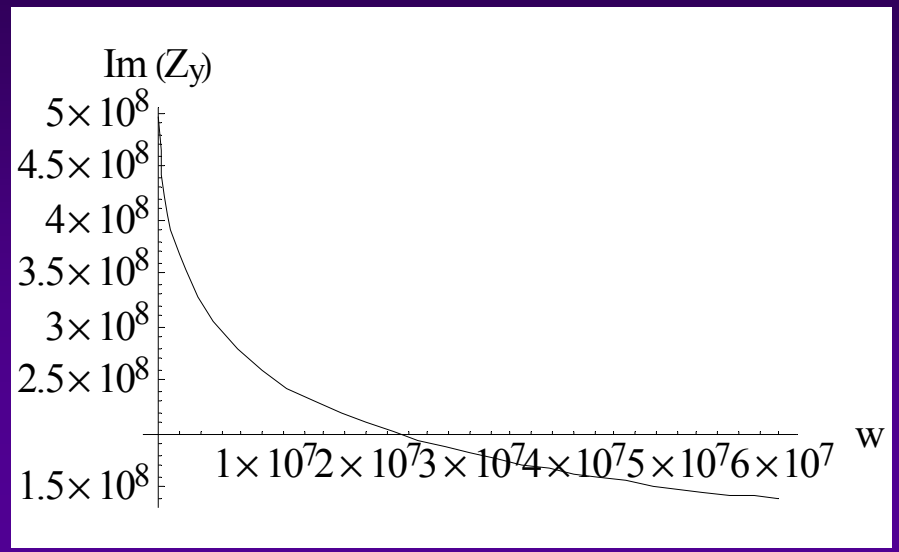


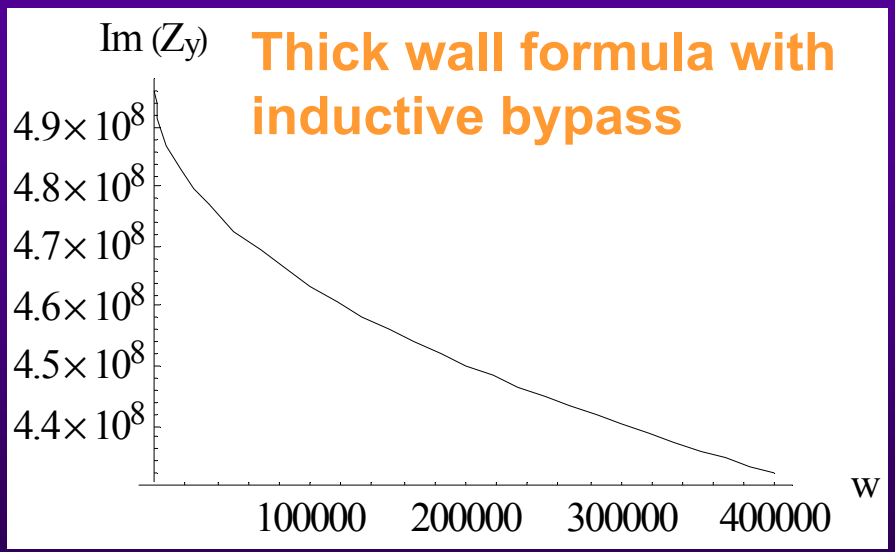


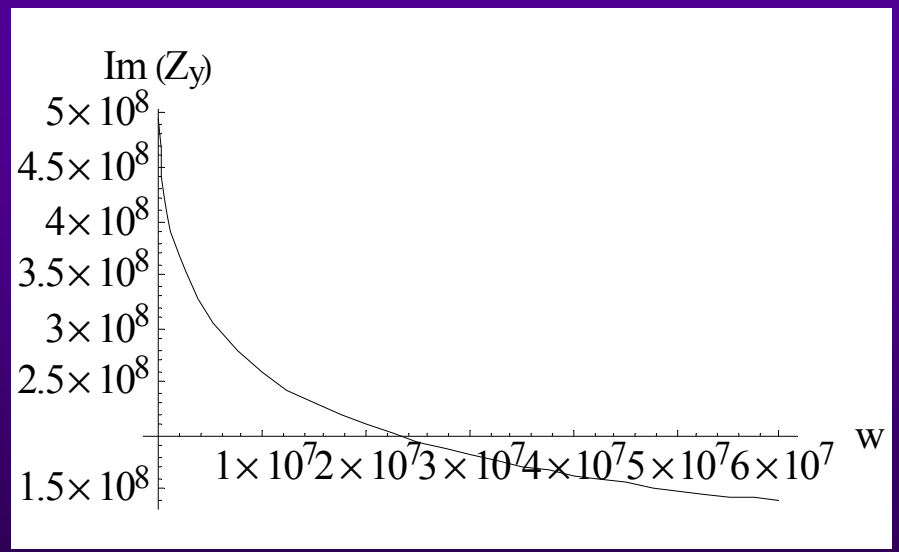


Plot of the total vertical impedance (2/2)









Collective tune shift for the most unstable coupled-bunch mode and head-tail mode 0 (1.15e11 p/b at 7 TeV)

- **General formula** $\Delta Q_y = -\left(7.49307 + 0.546151\, j\right)\times 10^{-4}$

- **Thick wall formula with inductive bypass used until now for the computation of the LHC collimator impedance**

$$\Delta Q_y = -\left(7.45226 + 0.54575\, j\right)\times 10^{-4}$$

⇒ **Less than 1% of error for the real part of the tune shift**

⇒ **Less than 1‰ of error for the imaginary part of the tune shift**