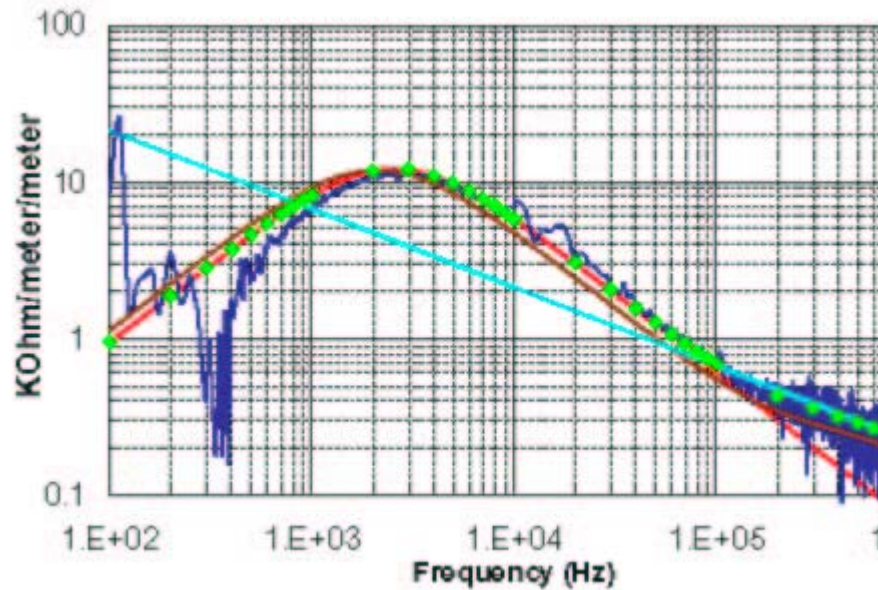
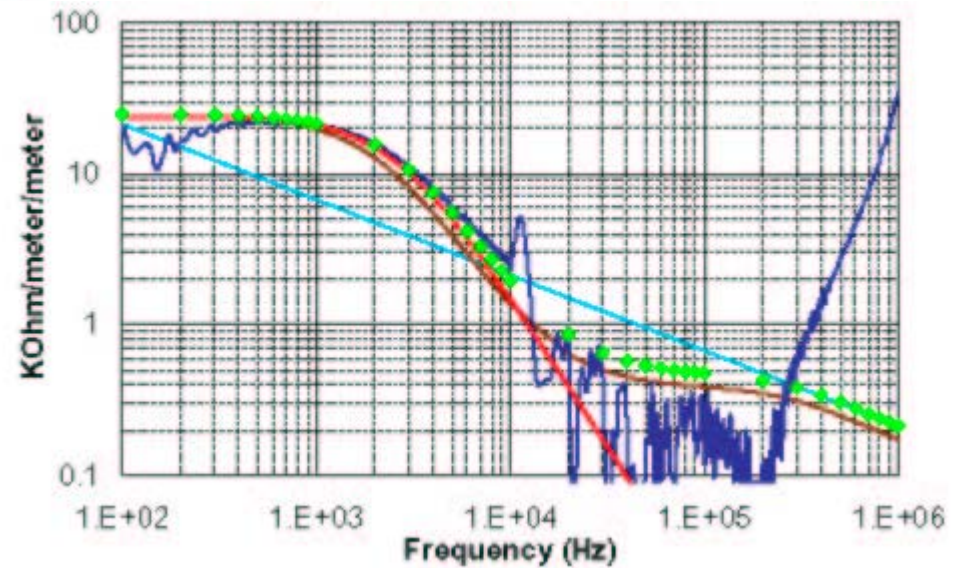


A. Mostacci, F. Caspers, U. Irizo, CERN-AB-2003-051 (RF)
“Bench measurements of transverse resistive impedance”

Real Part



Imaginary Part



dark blue line - measurement

light blue line - standard thick-wall formula

brown line – analytical model (which?)

green points – formula from Burov&Lebedev

red line – inductive bypass of Mostacci/Caspers/Irizo

inductive bypass from Luc Vos
 (no dependence on wall
 thickness t – for infinite wall?
 physical origin is obscure)

$$\frac{Z_l}{l} = \frac{1 - i \operatorname{sgn}(\omega)}{2\pi b} \sqrt{\frac{|\omega| \rho Z_0}{2c}}$$

$$\frac{Z_t}{l} = -\frac{2c}{\omega b^2} \frac{Z_l}{l} \frac{i\omega L}{2\pi} \frac{1}{\frac{Z_l}{l} - i \frac{\omega L}{2\pi}}$$

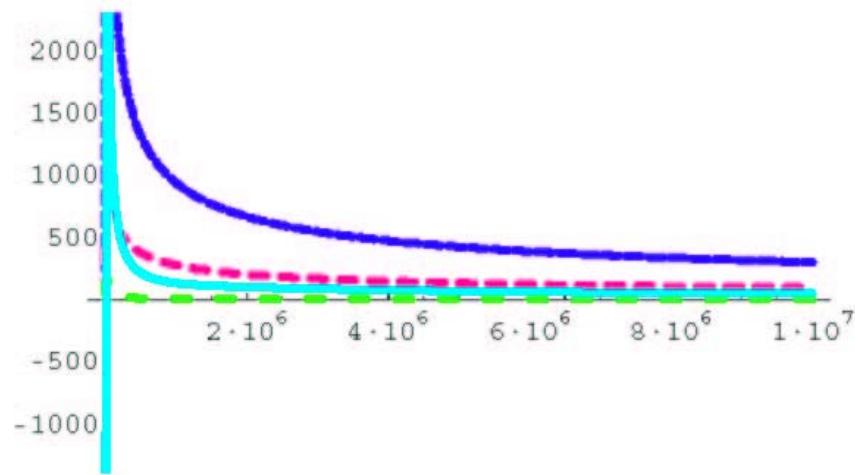
inductive bypass from Caspers,
 Mostacci, Irizo (here inductive effect
 depends on t and disappears for an
 infinite wall; physical origin obvious)

$$\frac{Z_t}{l} = \frac{c}{\pi b^3 \sigma \omega t} \frac{1 - i\omega_c / \omega}{1 + (\omega_c / \omega)^2}$$

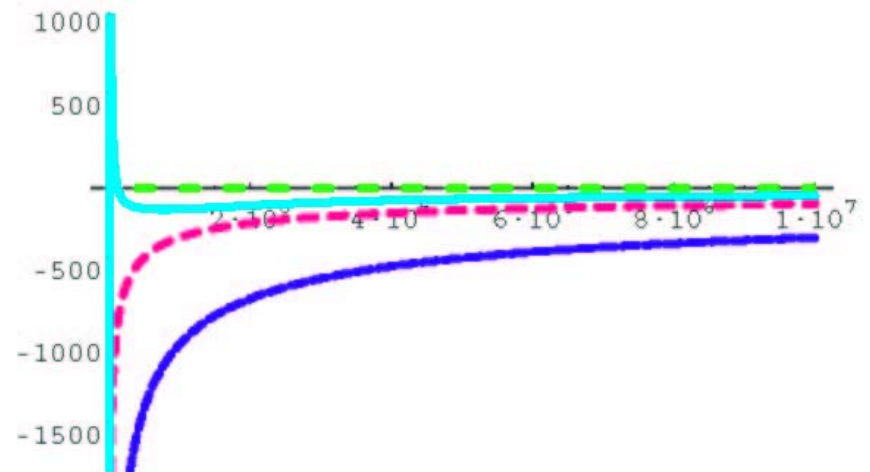
$$\omega_c = \frac{2}{\pi \mu b \sigma t}$$

comparison for warm BPMs

Real part of impedance [Ω/m^2]



Imaginary part of impedance [Ω/m^2]



inductive bypass - Mostacci/Caspers

inductive bypass – Luc Vos

Burov/Lebedev – steel

Burov/Lebedev – copper coating