VERTICAL IMPEDANCE (TRAPPED MODES) OF THE SPS BPH (2)

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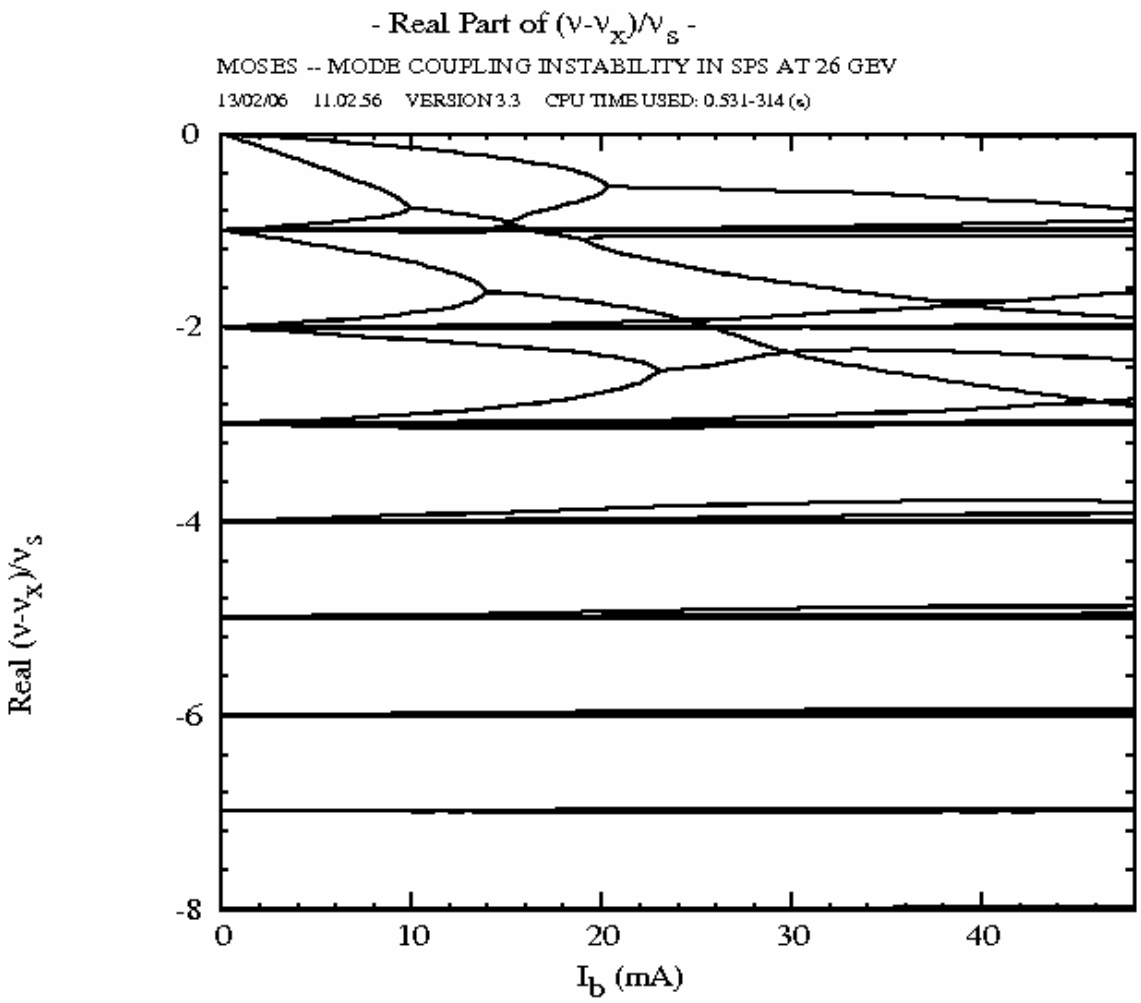
- **1st presentation last RLC meeting**
- **Update as the vertical impedance given by B. Spataro was not normalised by the transverse offset (4 mm here)**

⇒ **The impedance values of the last presentation have to be multiplied by 1/0.004 = 250!**

TMCI intensity threshold (1/2)

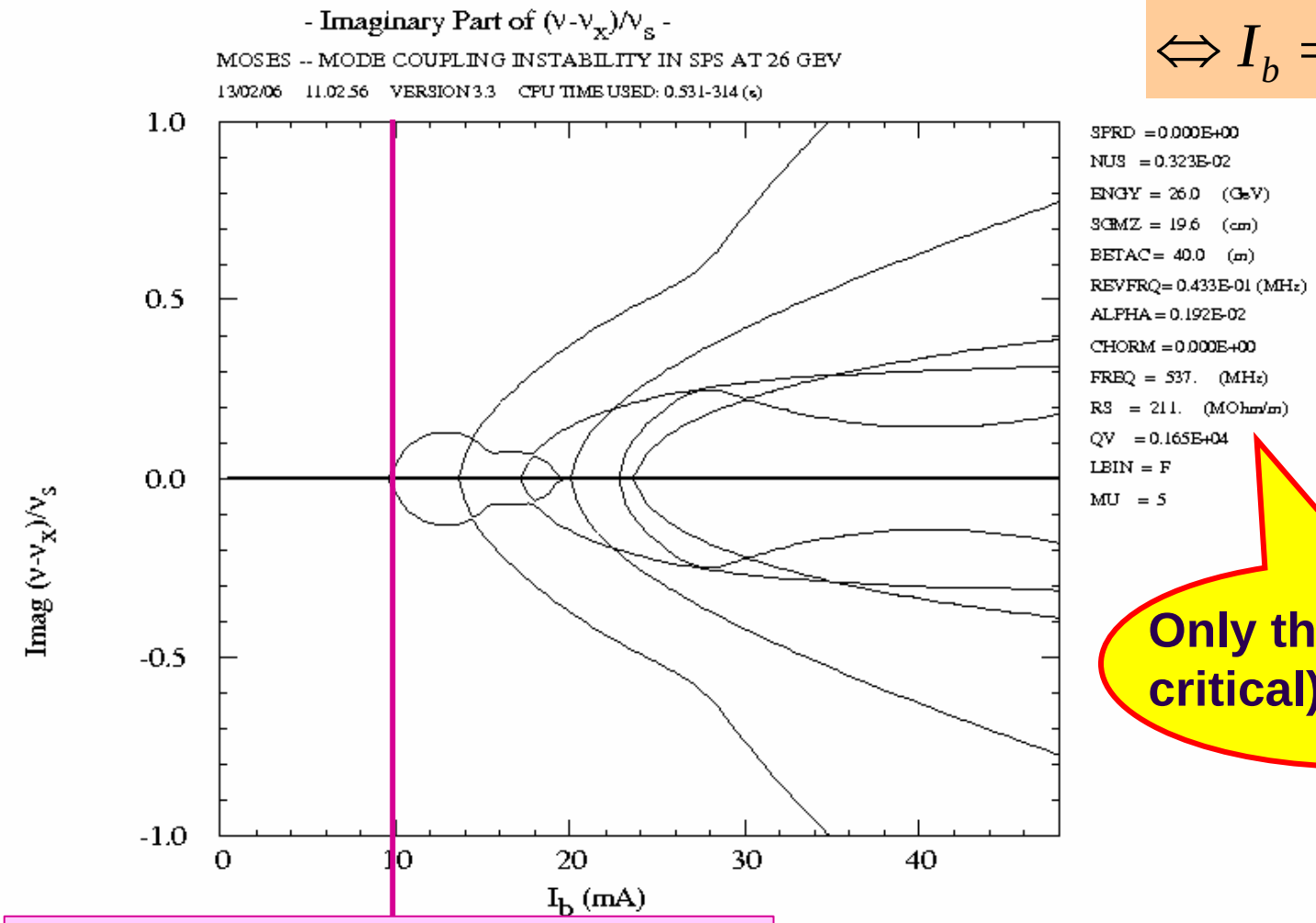


SPRD = 0.000E+00
NUS = 0.323E-02
ENGY = 26.0 (GeV)
SGMZ = 19.6 (cm)
BETAC = 40.0 (m)
REVFRQ = 0.433E-01 (MHz)
ALPHA = 0.192E-02
CHORM = 0.000E+00
FREQ = 537. (MHz)
RS = 211. (MOhm/m)
QV = 0.165E+04
LBIN = F
MU = 5

Only the 1st (most critical) resonance

TMCI intensity threshold (2/2)

$$N_b = 1.2\,10^{11}\ \text{p}$$
$$\Leftrightarrow I_b = 0.83\,\text{mA}$$



Only the 1st (most critical) resonance

$$I_b^{th} \approx 10\,\text{mA} \Rightarrow N_b^{th} \approx 1.4\,10^{12}\ \text{p}$$

CONCLUSION

- **The predicted intensity threshold is now much closer to the observed one, but it is still more than 1 order of magnitude above it**
- **Next step: Put all the 4 resonances (See below ⇒ For all the BPMs) in HEADTAIL**
  - **Introduce the quadrupolar oscillation observed during the MD**
  - **With and without space charge**

$f_{r1} = 0.537\ \text{GHz}$ $Q_1 = 1650$ $R_{y1} = 423.2\ \ \text{M}\Omega/\text{m}$

$f_{r2} = 0.9365\ \text{GHz}$ $Q_2 = 2165$ $R_{y2} = 100.5\ \ \text{M}\Omega/\text{m}$ $\beta_x^{BPH} = 103\ \text{m}$

$f_{r3} = 1.2\ \text{GHz}$ $Q_3 = 2300$ $R_{y3} = 422.3\ \ \text{M}\Omega/\text{m}$ $\beta_y^{BPH} = 21\ \text{m}$

$f_{r4} = 1.7\ \text{GHz}$ $Q_4 = 2900$ $R_{y4} = 78.3\ \ \text{M}\Omega/\text{m}$