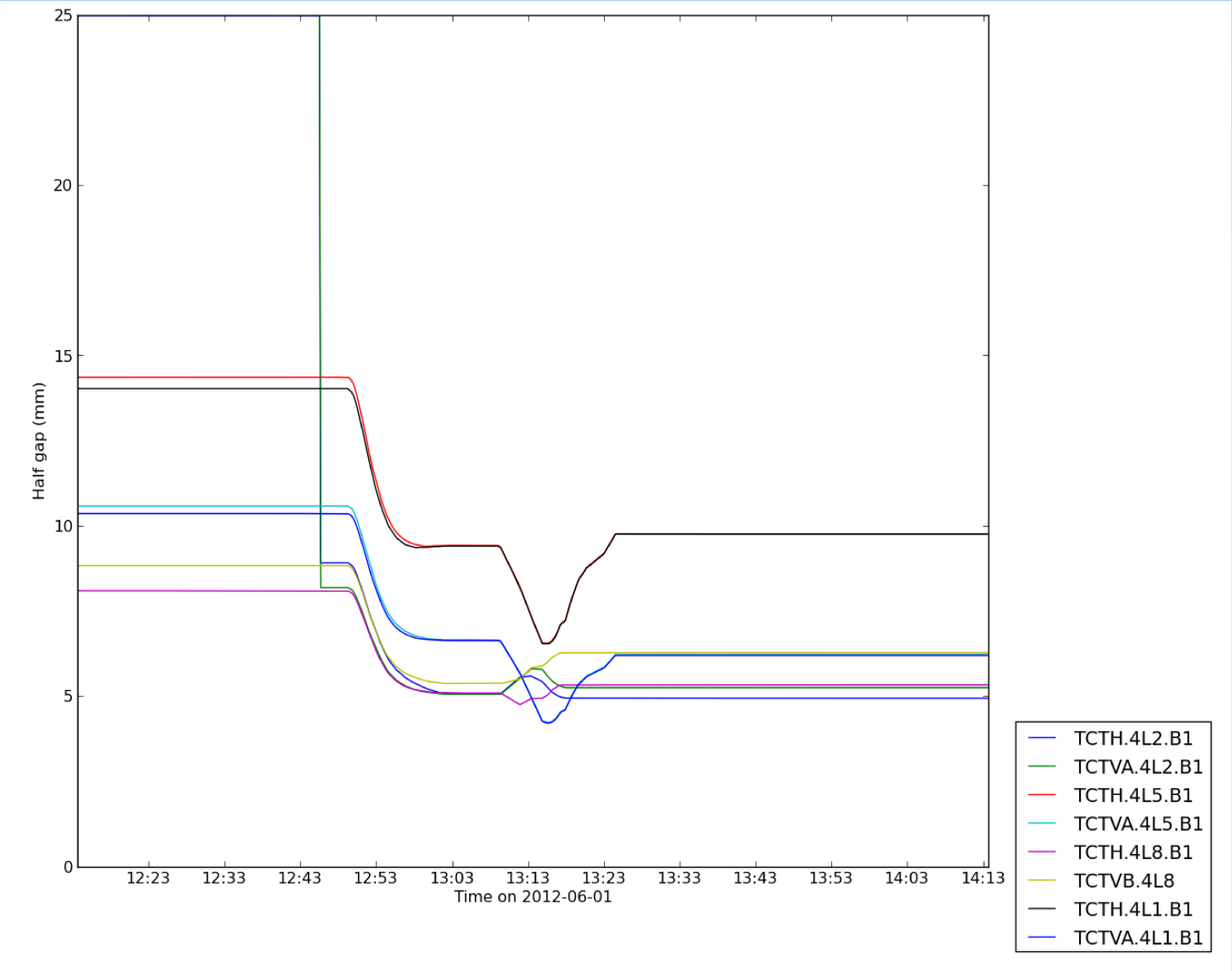
Status of the impedance model with tight settings

N. Mounet and E. Métral

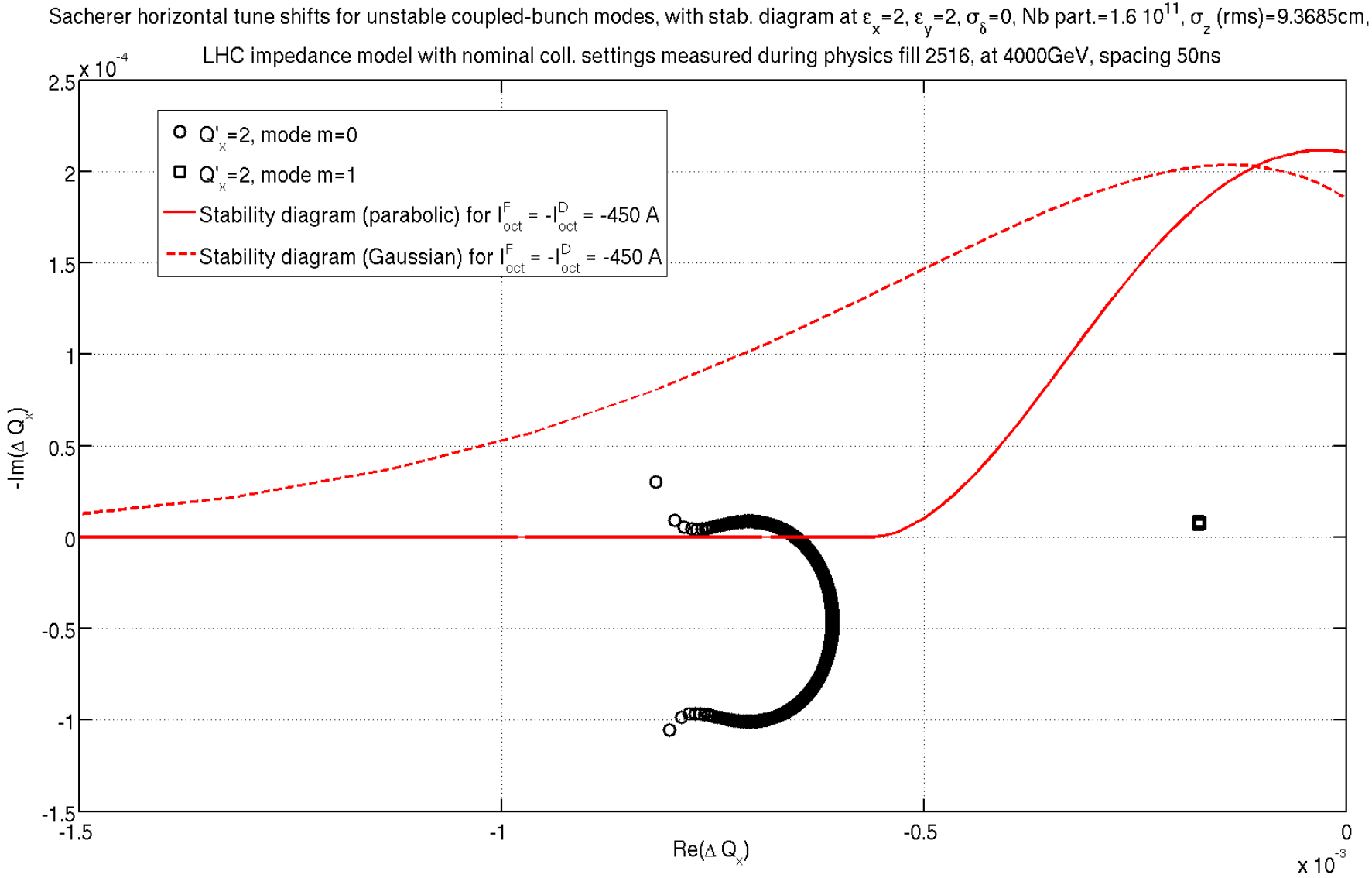
Evolution during squeeze

- Only TCTs (and TCL) move during the squeeze:



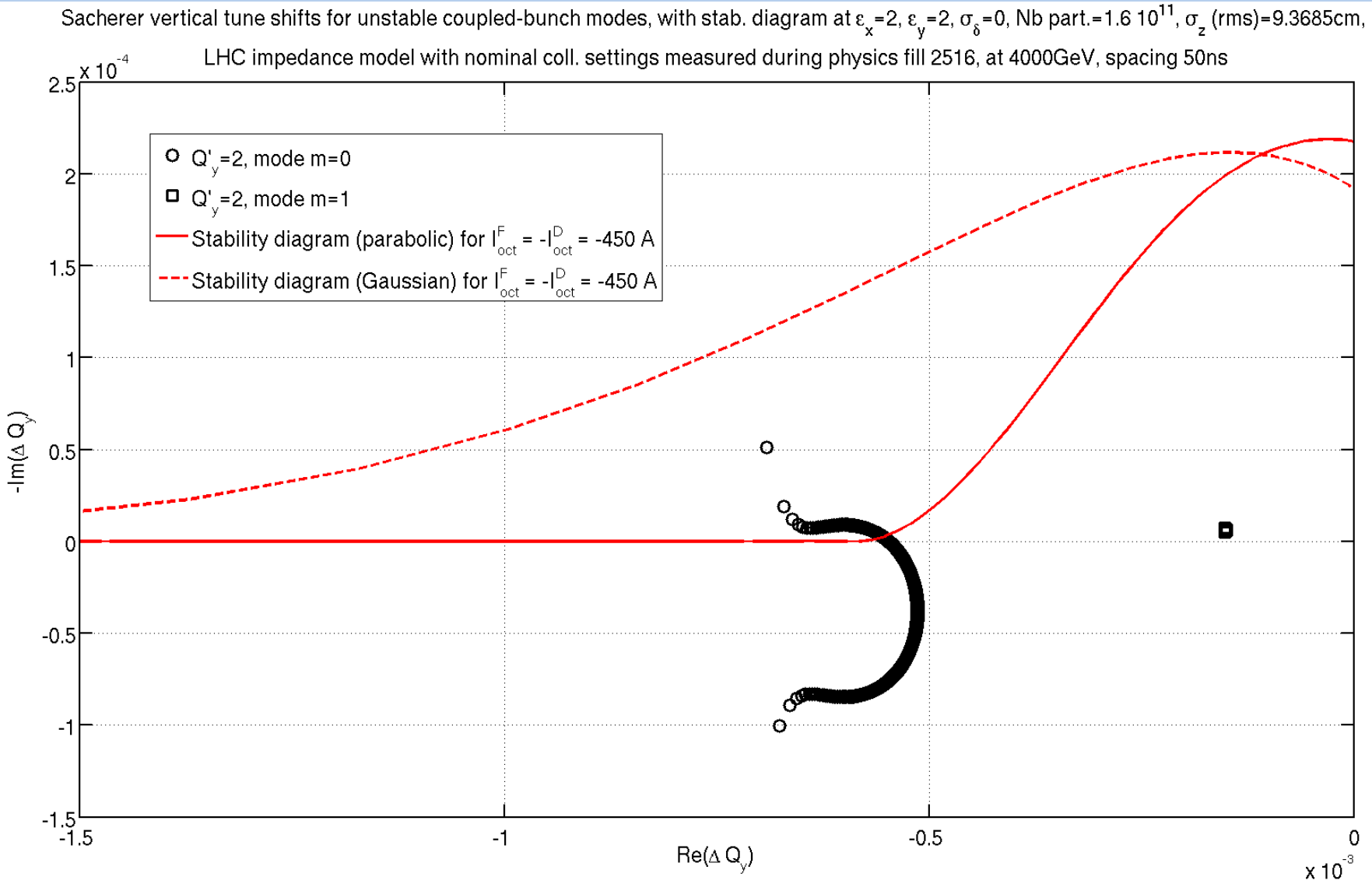
Stability diagrams

- All coupled-bunch modes (50ns), m=0 and 1, with octupoles (horizontal):



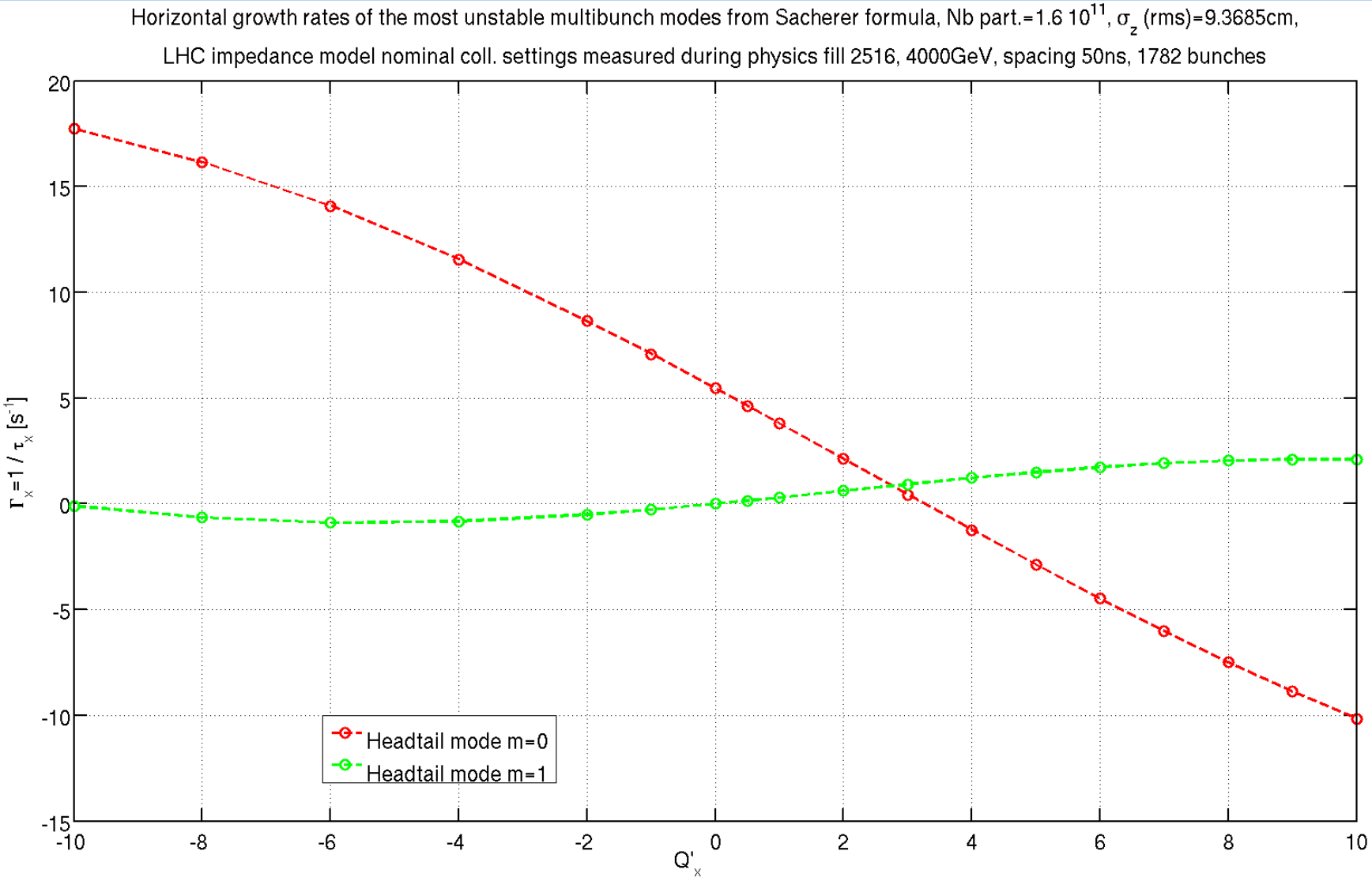
Stability diagrams

- All coupled-bunch modes (50ns), for m=0 and 1, with octupoles (vertical):



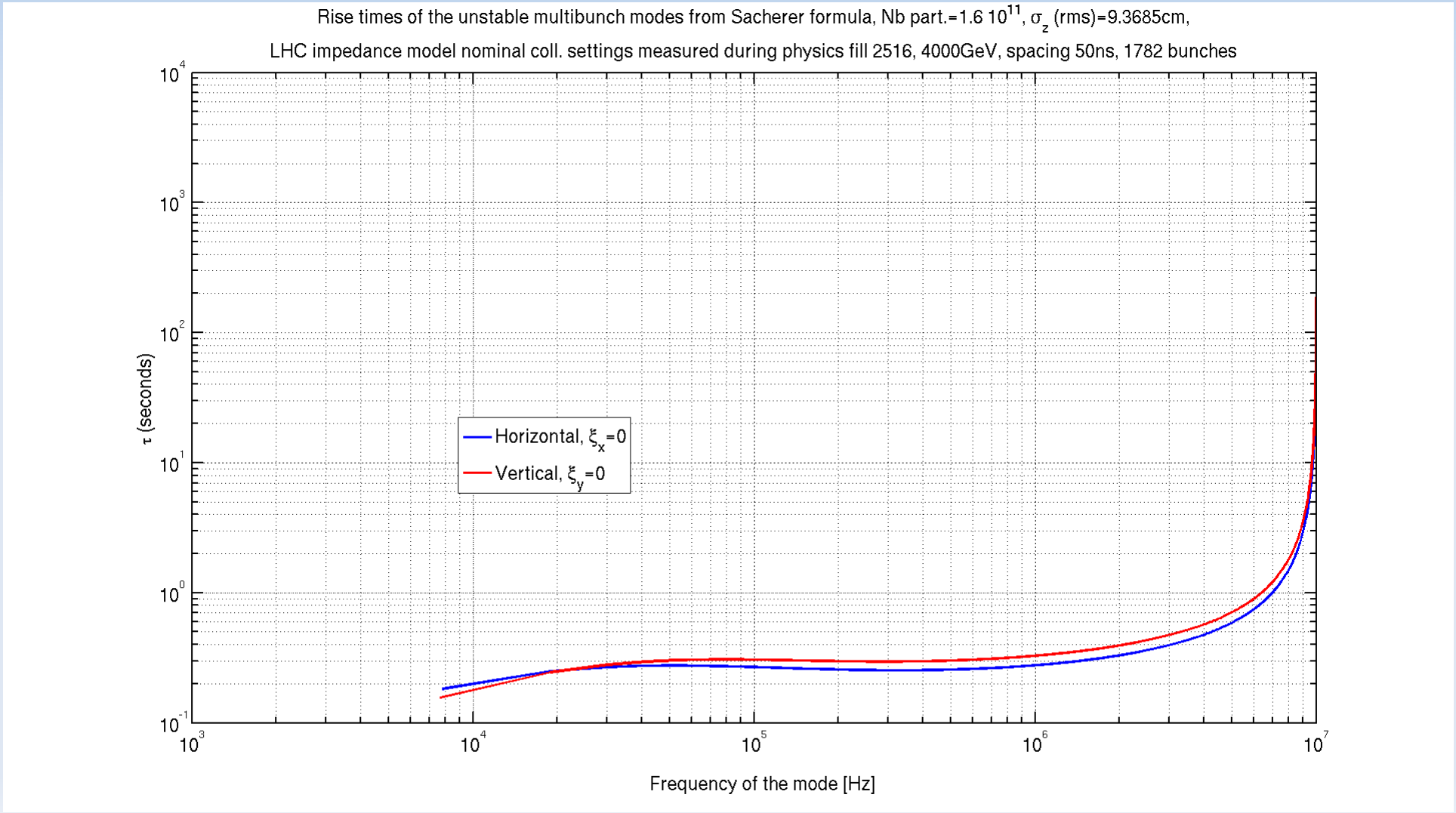
Growth rate vs. chromaticity

- For the most unstable coupled-bunch mode (50ns), m=0 and 1



Rise time vs. coupled-bunch mode frequency

- For rigid-bunch modes (m=0), rise time more or less flat vs frequency, up to ~1 Mhz:



Summary

- Very little variation of impedance during squeeze.
- Coupled-bunch modes with |m|=1 are well inside the stability diagram of the octupoles, even considering parabolic distribution cut at 3.2 σ.
- Coupled-bunch modes with m=0 (rigid-bunch), if not damped by feedback, could be out of stability diagram (with octupoles only) if transverse distributions are cut.
- Optimum vs chromaticity, for both modes 0 and 1, close to current choice (Q'=2). Slightly higher (Q'=5) would damp mode 0, slightly lower (Q'<0) would damp mode 1.