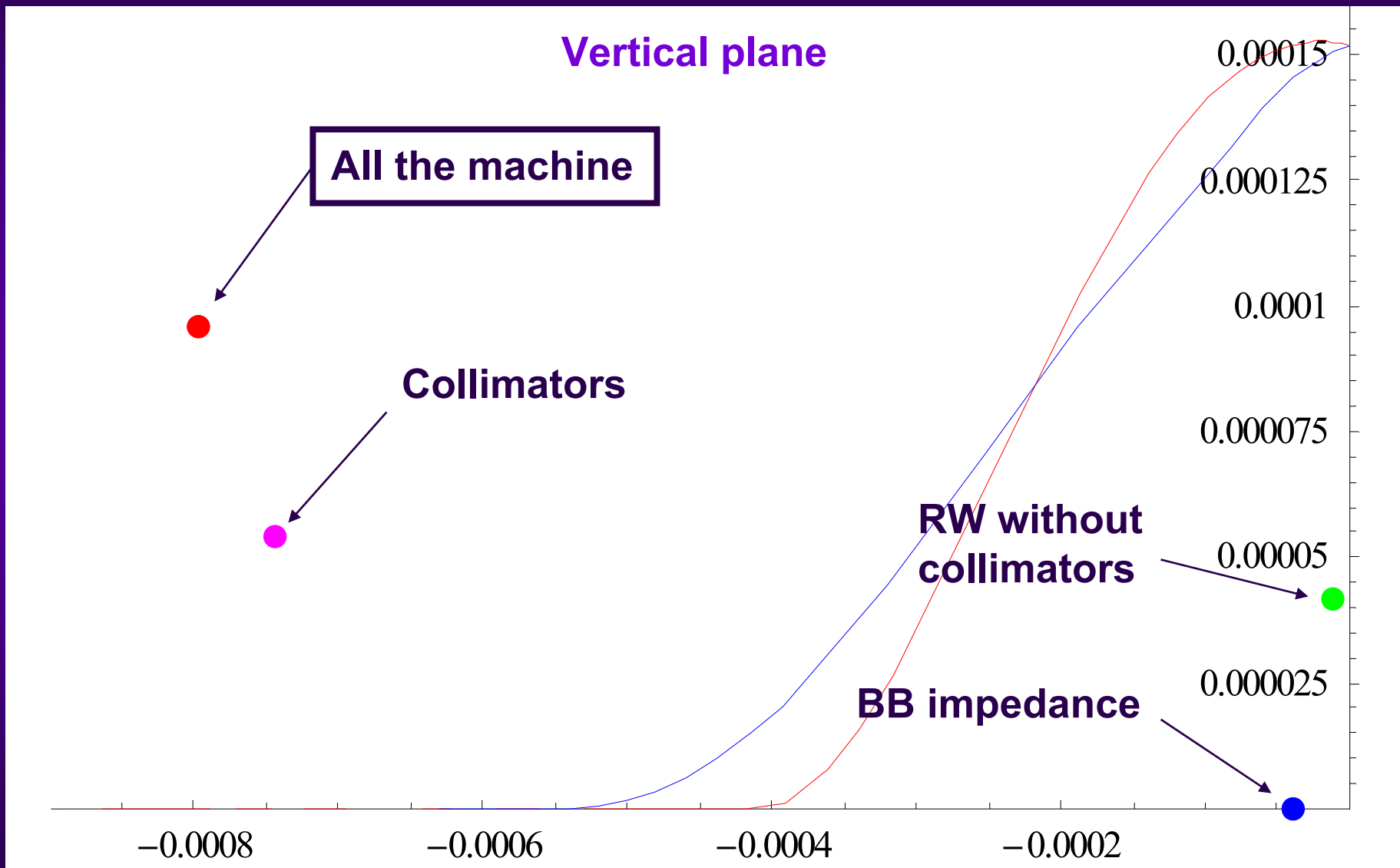


# AUTOMATIC COLLIMATOR IMPEDANCE COMPUTATIONS

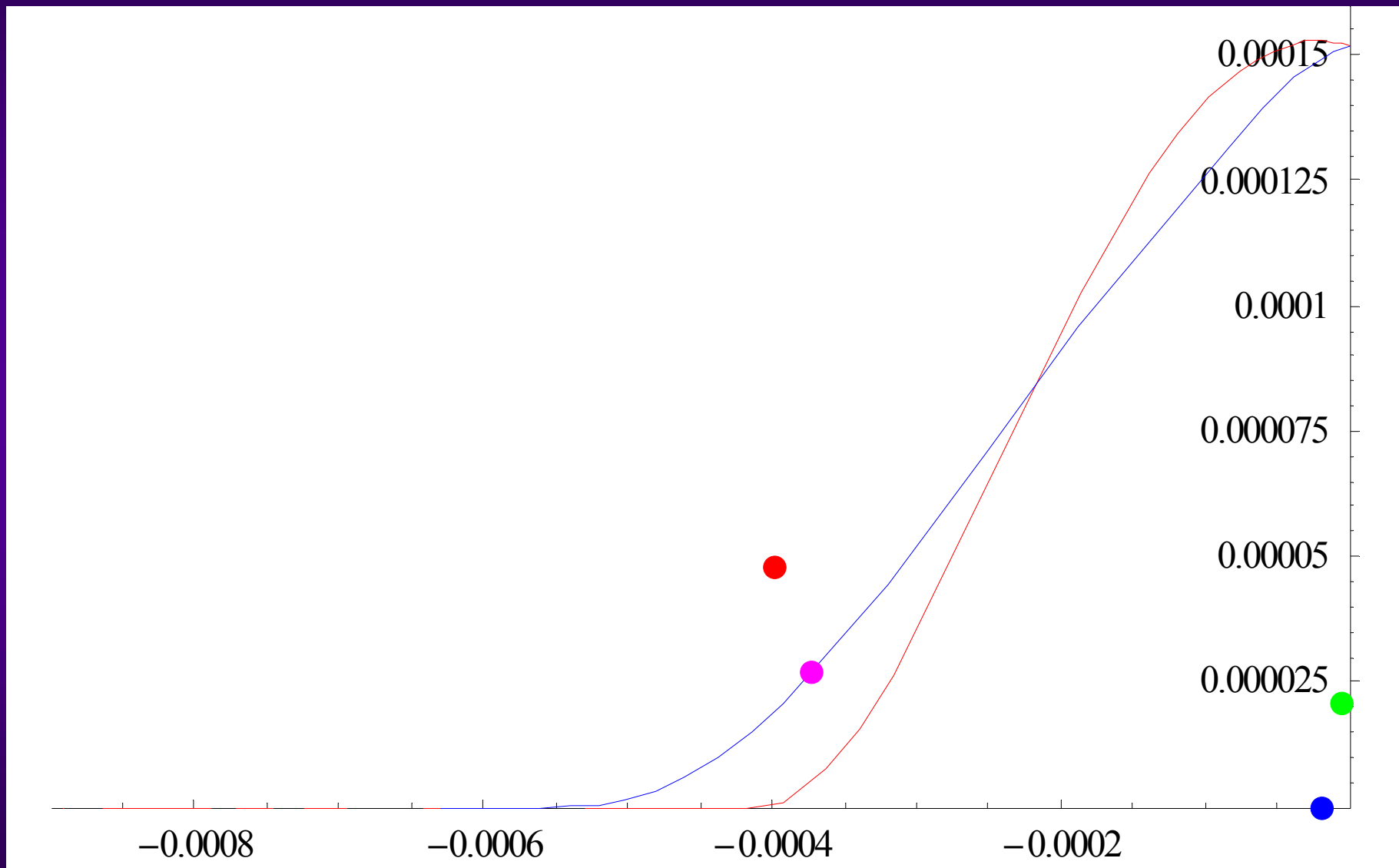
E. Metral

- ◆ **Stability diagram and coherent tune shift for the LHC beams taking into account**
  - All the collimators (IR7 v26top6n1b1 and IR3 from June)
  - The Resistive-Wall (RW) impedance from the rest of the machine (i.e. without collimators)
  - The Broad-Band (BB) impedance

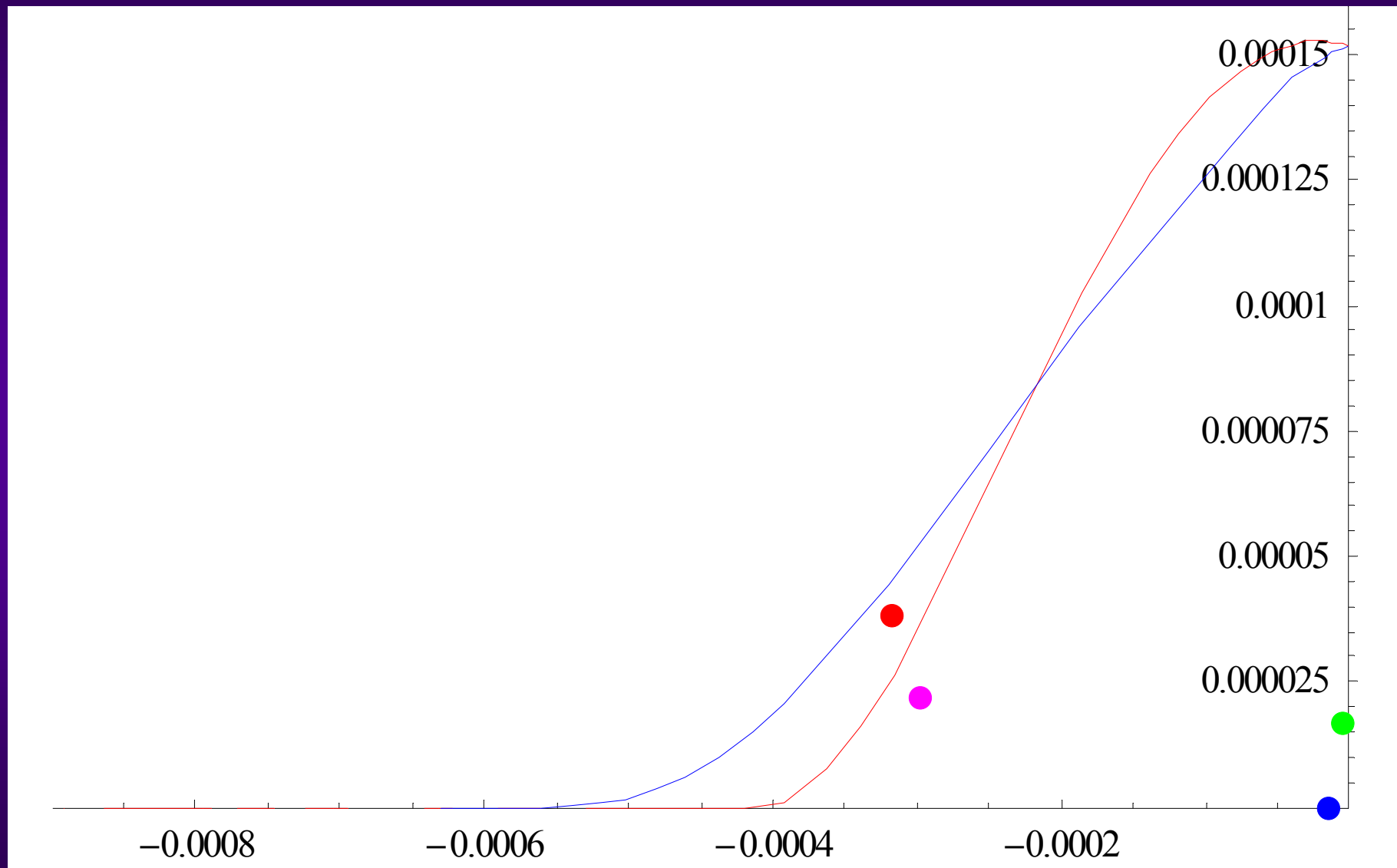
# Stability diagram (maximum octupoles) and collective tune shift for the most unstable coupled-bunch mode and head-tail mode 0 (1.15e11 p/b at 7 TeV)



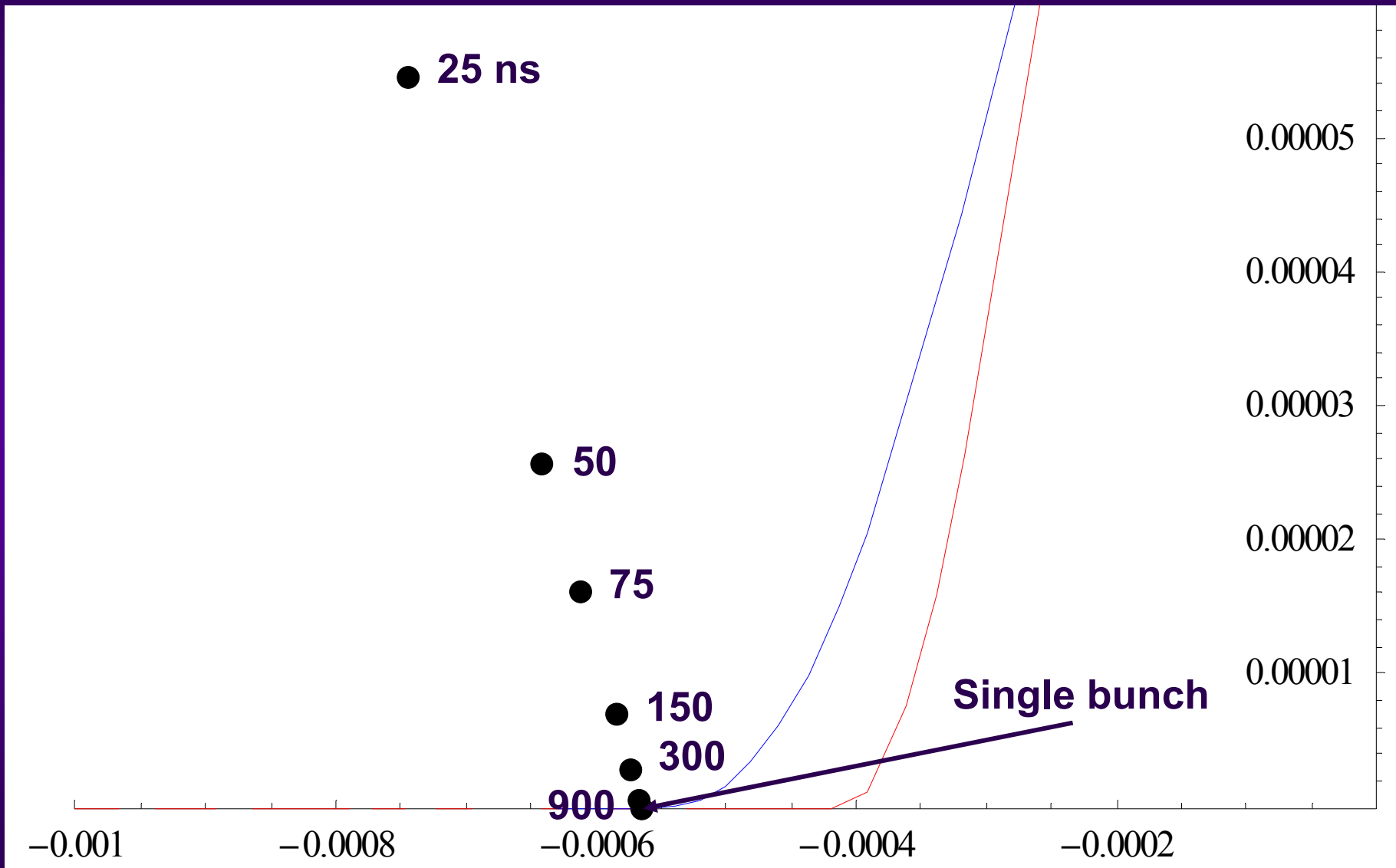
# Stability diagram (maximum octupoles) and collective tune shift for the most unstable coupled-bunch mode and head-tail mode 0 ( $0.5 \times 1.15e11$ p/b at 7 TeV)



# Stability diagram (maximum octupoles) and collective tune shift for the most unstable coupled-bunch mode and head-tail mode 0 ( $0.4 \times 1.15e11$ p/b at 7 TeV)



# Stability diagram (maximum octupoles) and collective tune shift for the most unstable coupled-bunch mode and head-tail mode 0 (1.15e11 p/b at 7 TeV)



- ◆ **Why is the real part of the tune shift almost the same for 3564 bunches and 1 bunch?**
  - ⇒ **Due to the ~single-bunch effect of the inductive bypass (symmetrical impedance)**
- ◆ **The effect of the reduced number of bunches (⇒ More lines in the frequency spectrum) is seen on the imaginary part of the tune shift (asymmetrical impedance). For 1 bunch the imaginary part is equal to 0 ⇒ No instability for 0 chromaticity**