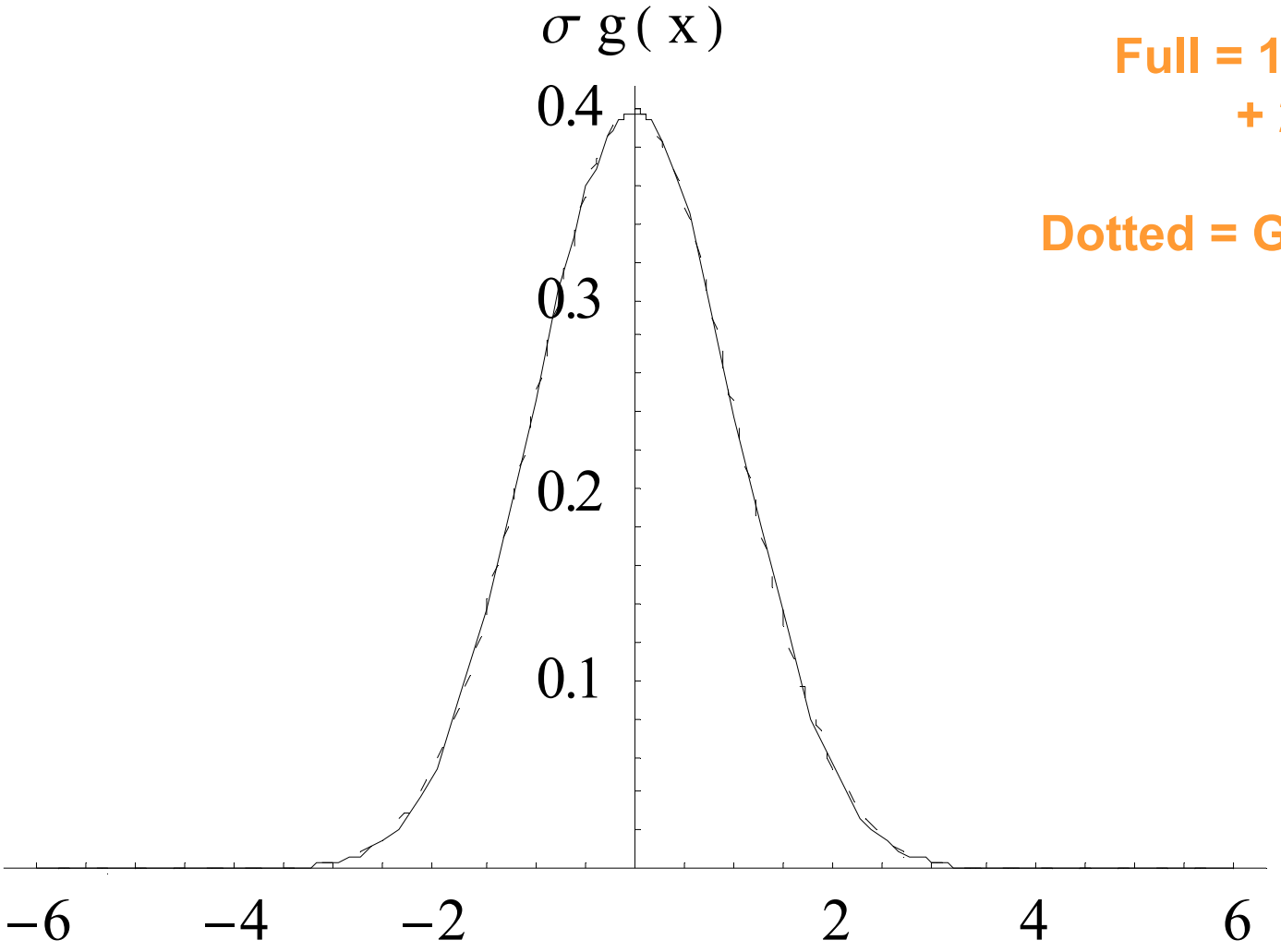
STABILITY DIAGRAM FOR A BEAM COLLIMATED AT 6 SIGMAS WITH TAILS OF THE DISTRIBUTION MORE POPULATED THAN THE GAUSSIAN

Which can happen in reality in proton machines where several diffusive phenomena can take place!

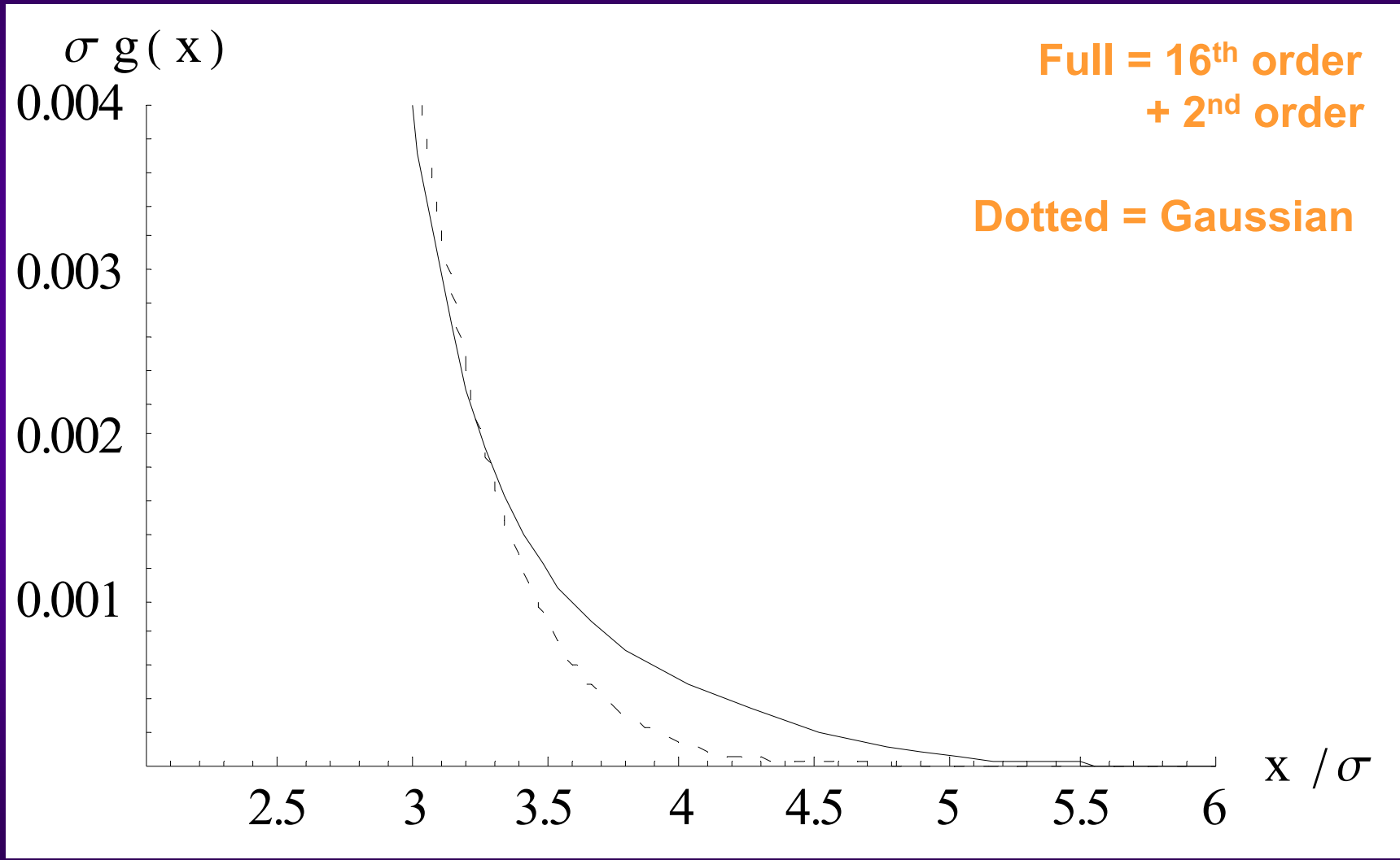
Transverse beam profiles



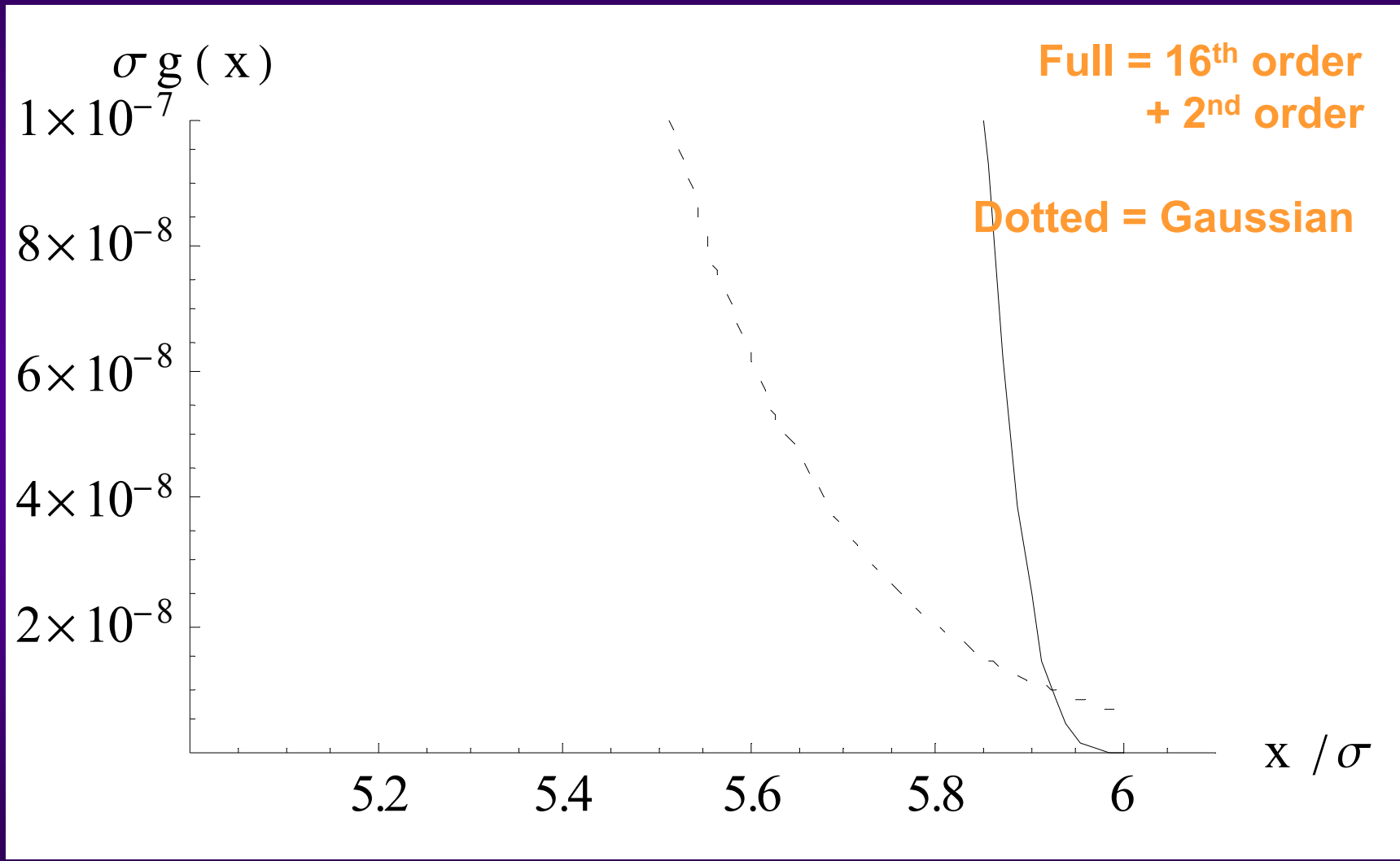
Full = 16th order
+ 2nd order

Dotted = Gaussian

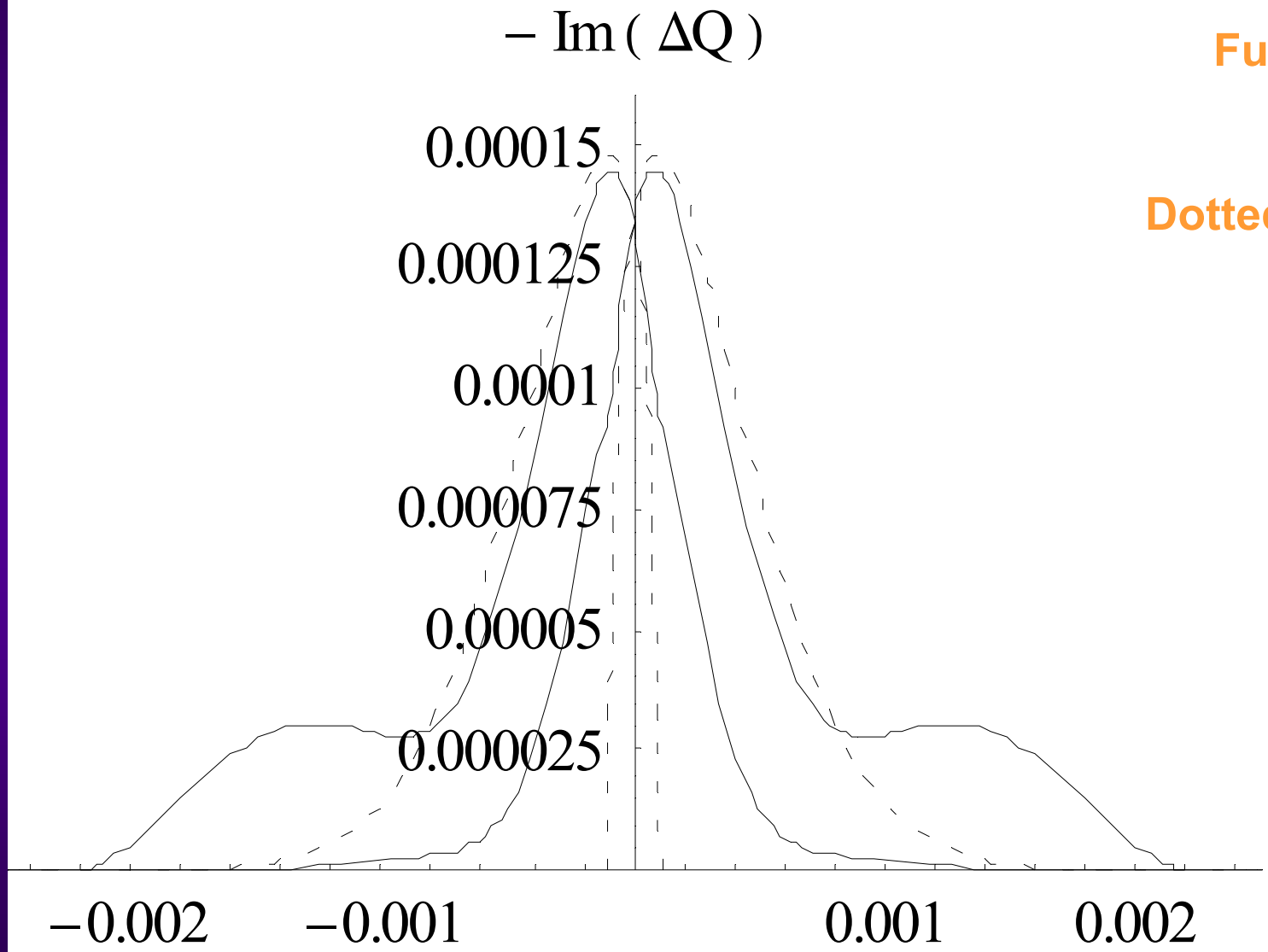
Zoom of the tails of the transverse beam profiles (1/2)



Zoom of the tails of the transverse beam profiles (2/2)



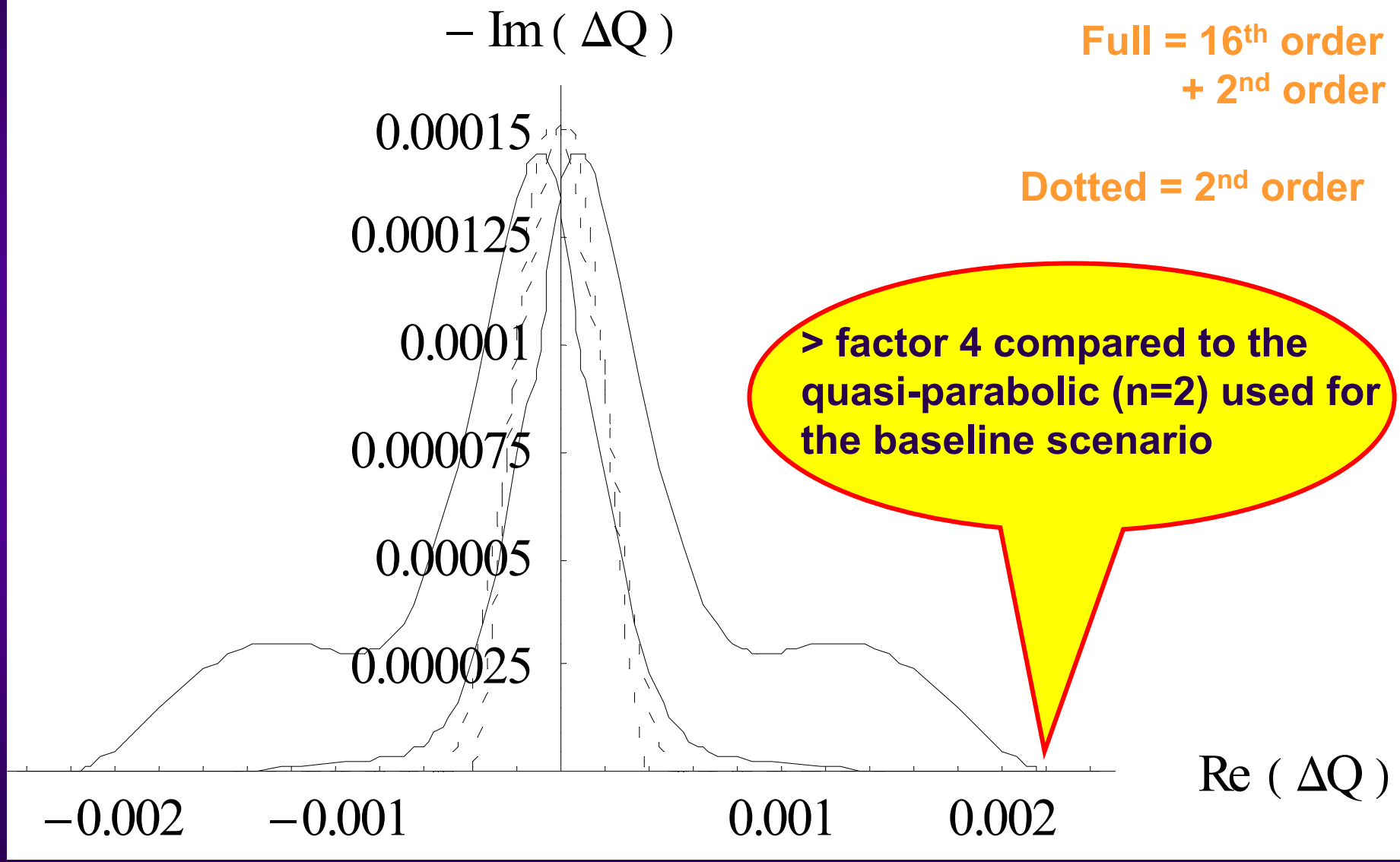
Stability diagram (maximum octupoles) for the LHC at top energy (1/2)



Full = 16th order
+ 2nd order

Dotted = Gaussian

Stability diagram (maximum octupoles) for the LHC at top energy (2/2)



Conclusion

- The cases treated are not unrealistic cases !
- They have no pathologies and correspond to collimated beams !
- What can we do next ? :
  - Take the real transverse beam profile (from measurements or simulations)
  - Fit this profile with our distributions
  - Compute the stability diagram