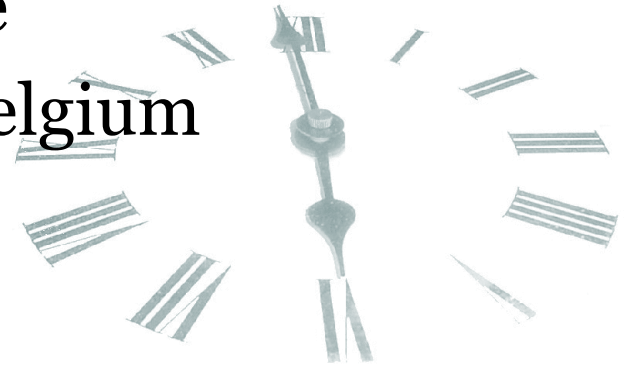
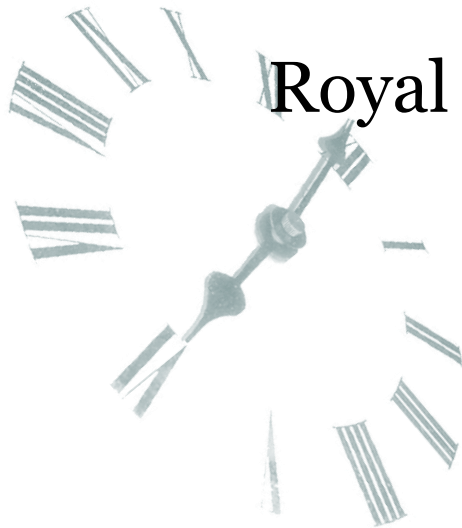




GNSS Time and Frequency Transfer: state of the art and possible evolution

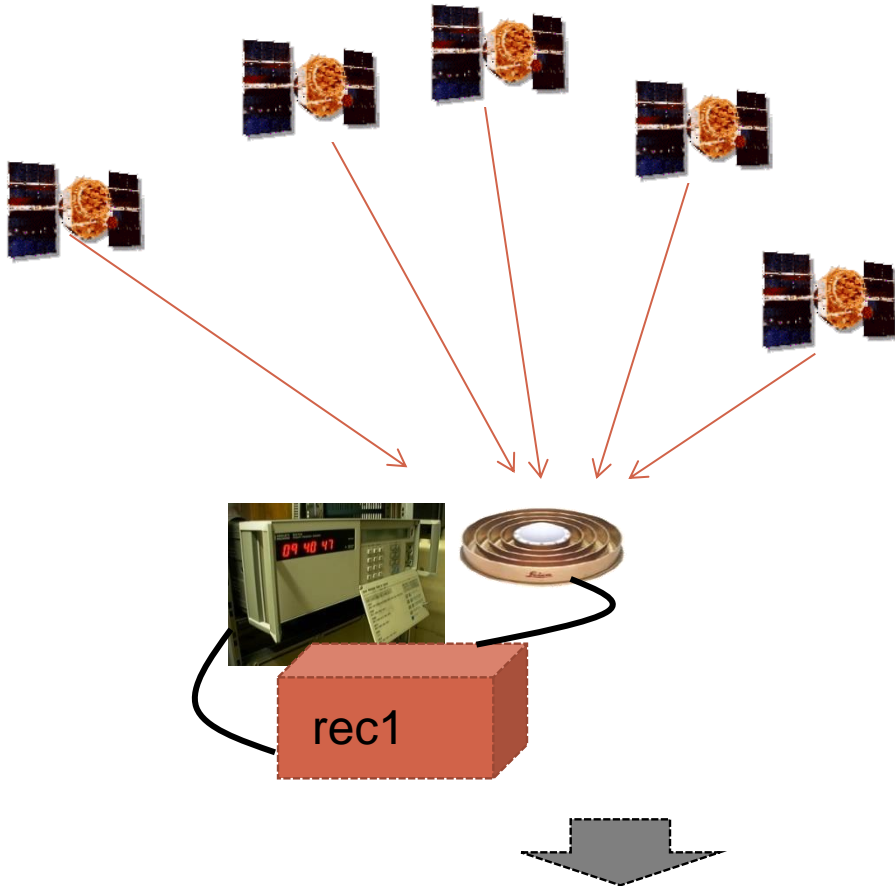
Pascale Defraigne

Royal Observatory of Belgium

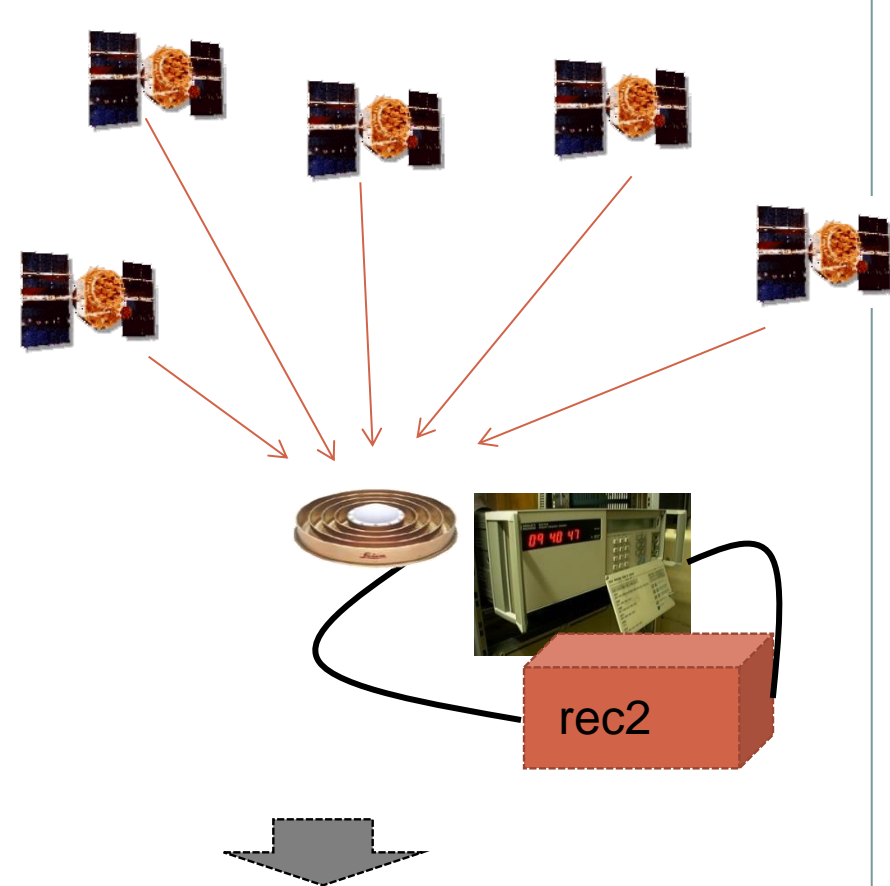


Precise Point Positioning

Use precise satellite orbits and clocks + comprehensive modeling of observations

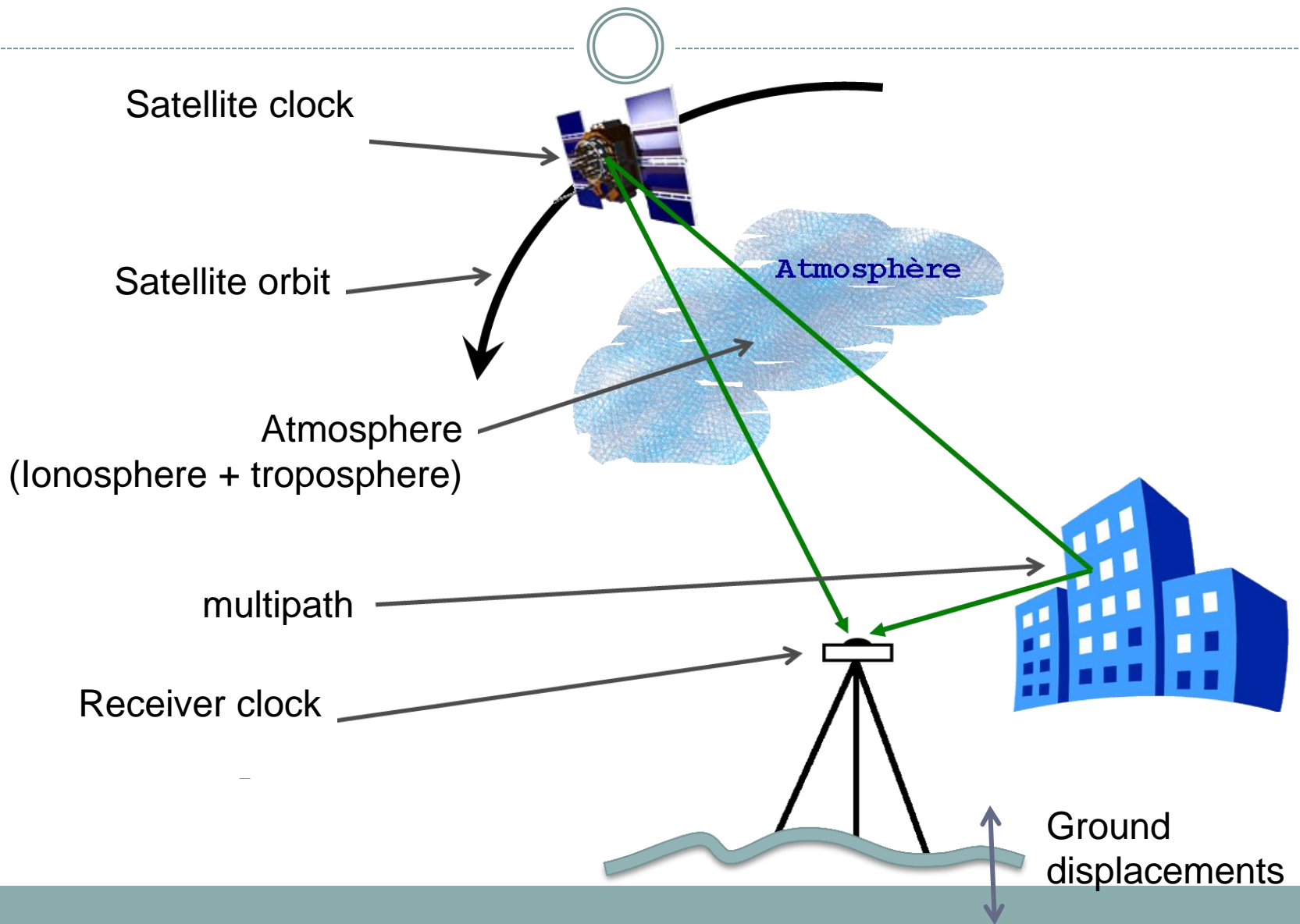


At each epoch, average of satellites
→ Clock1-REF (t)

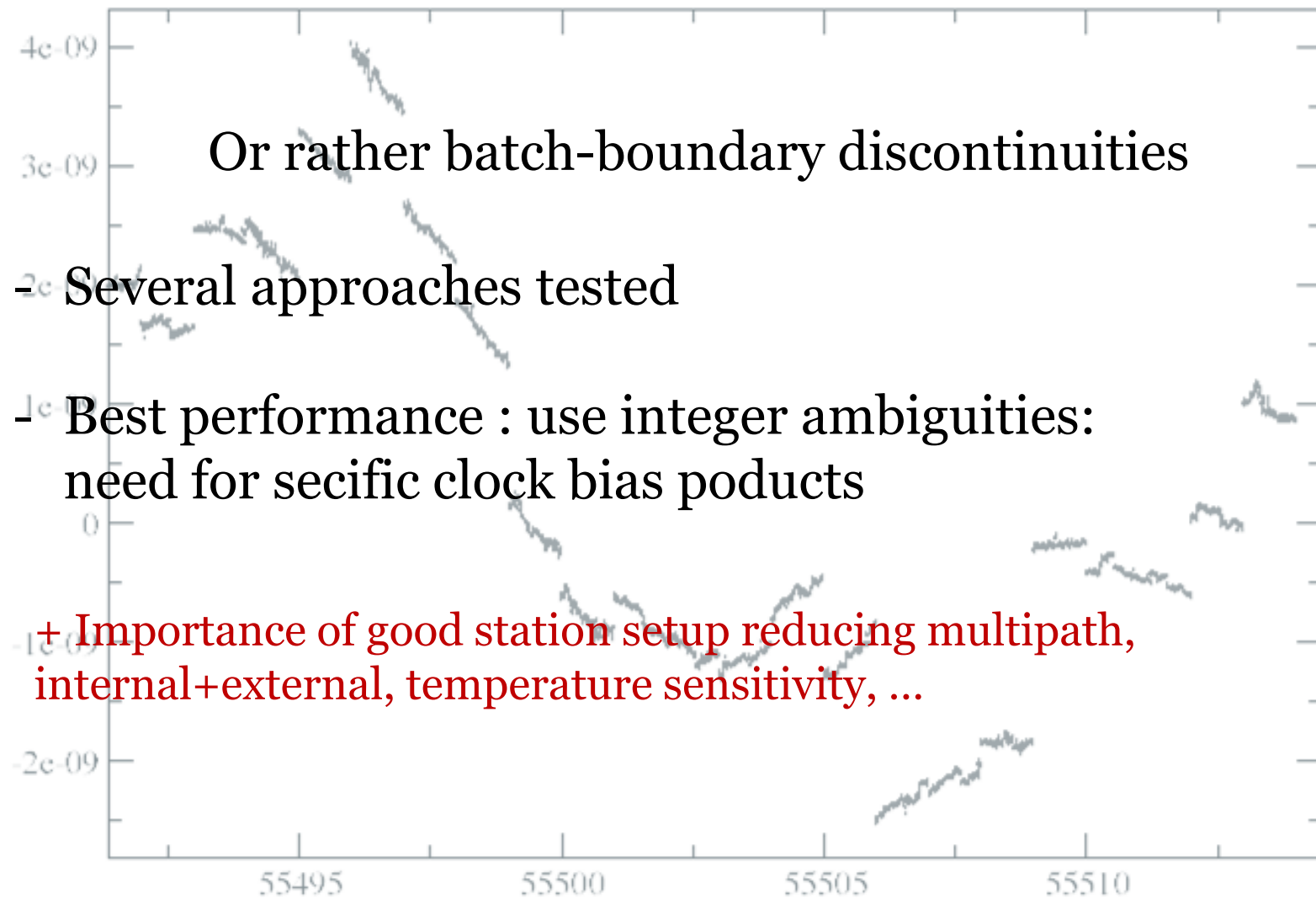


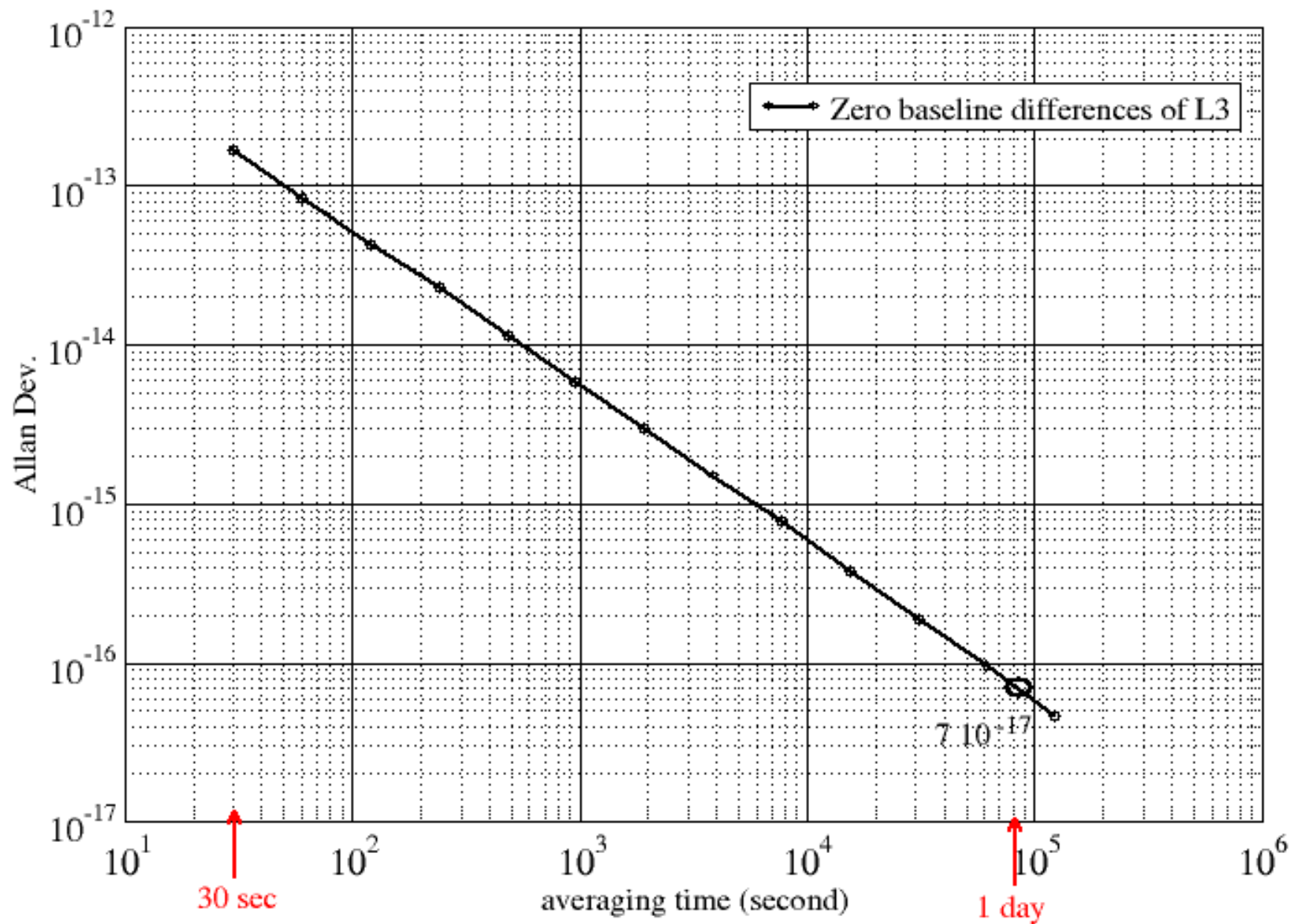
At each epoch, average of satellites
→ Clock2-REF (t)

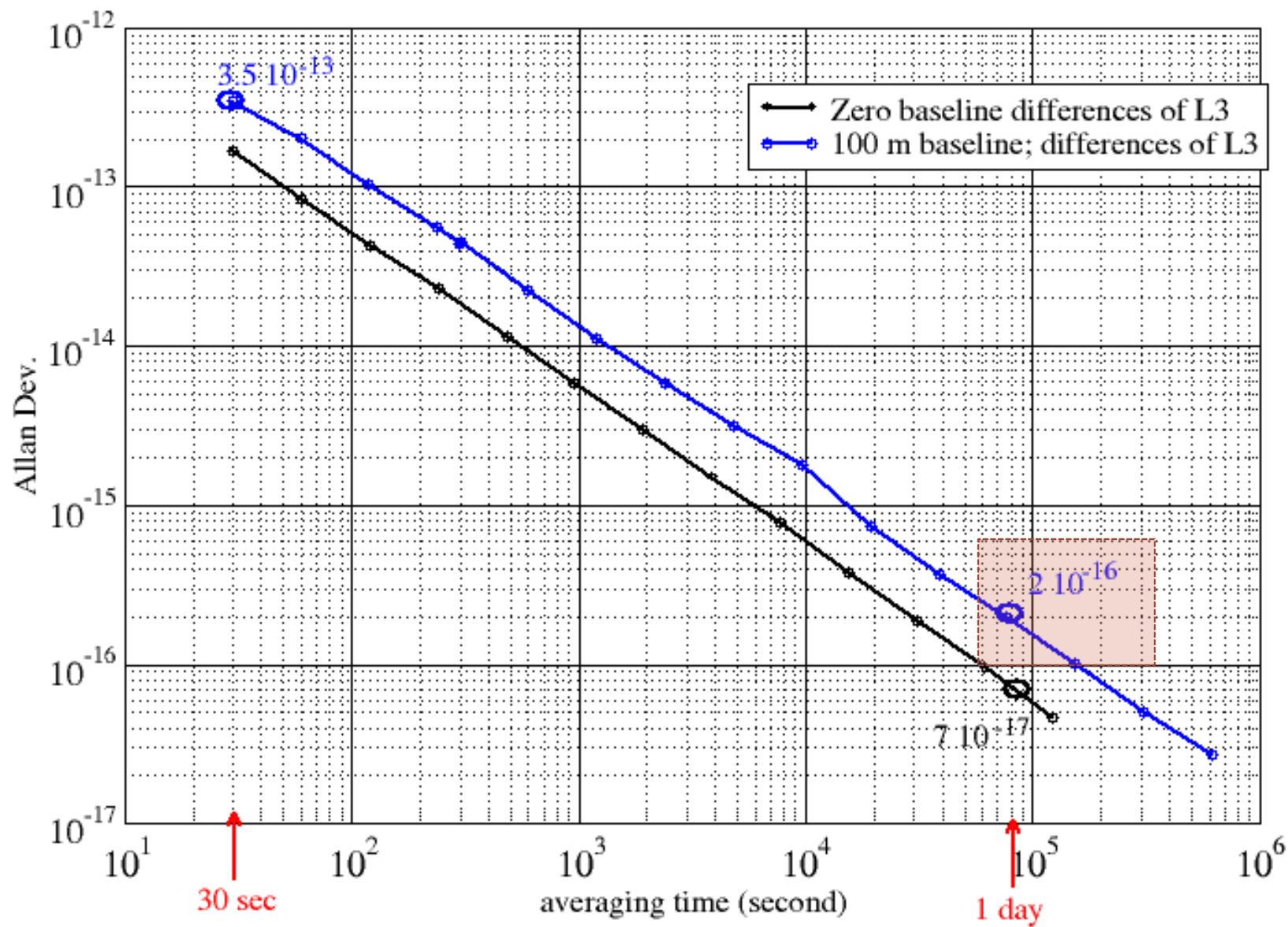
Observation modeling

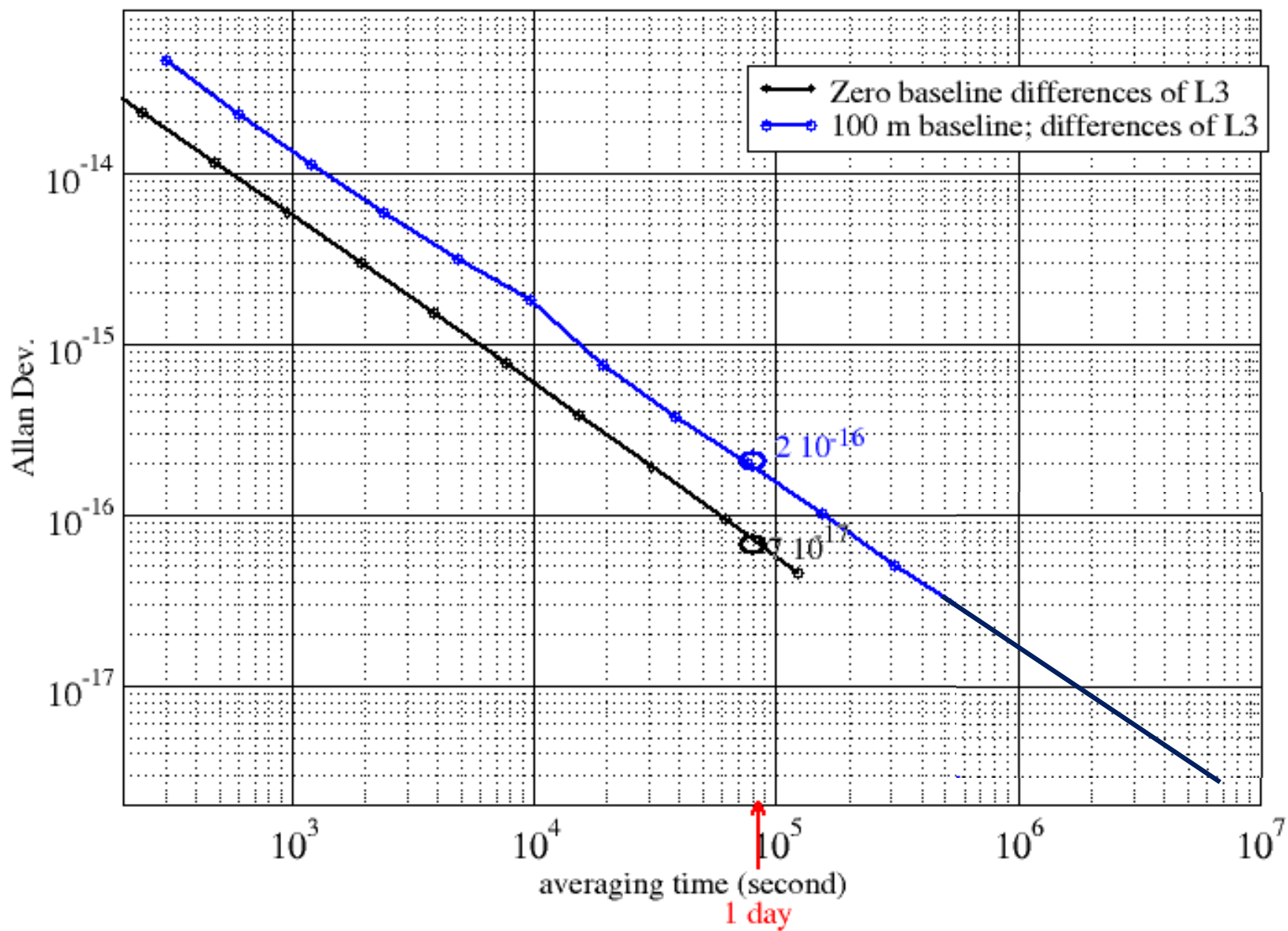


Day boundary discontinuities



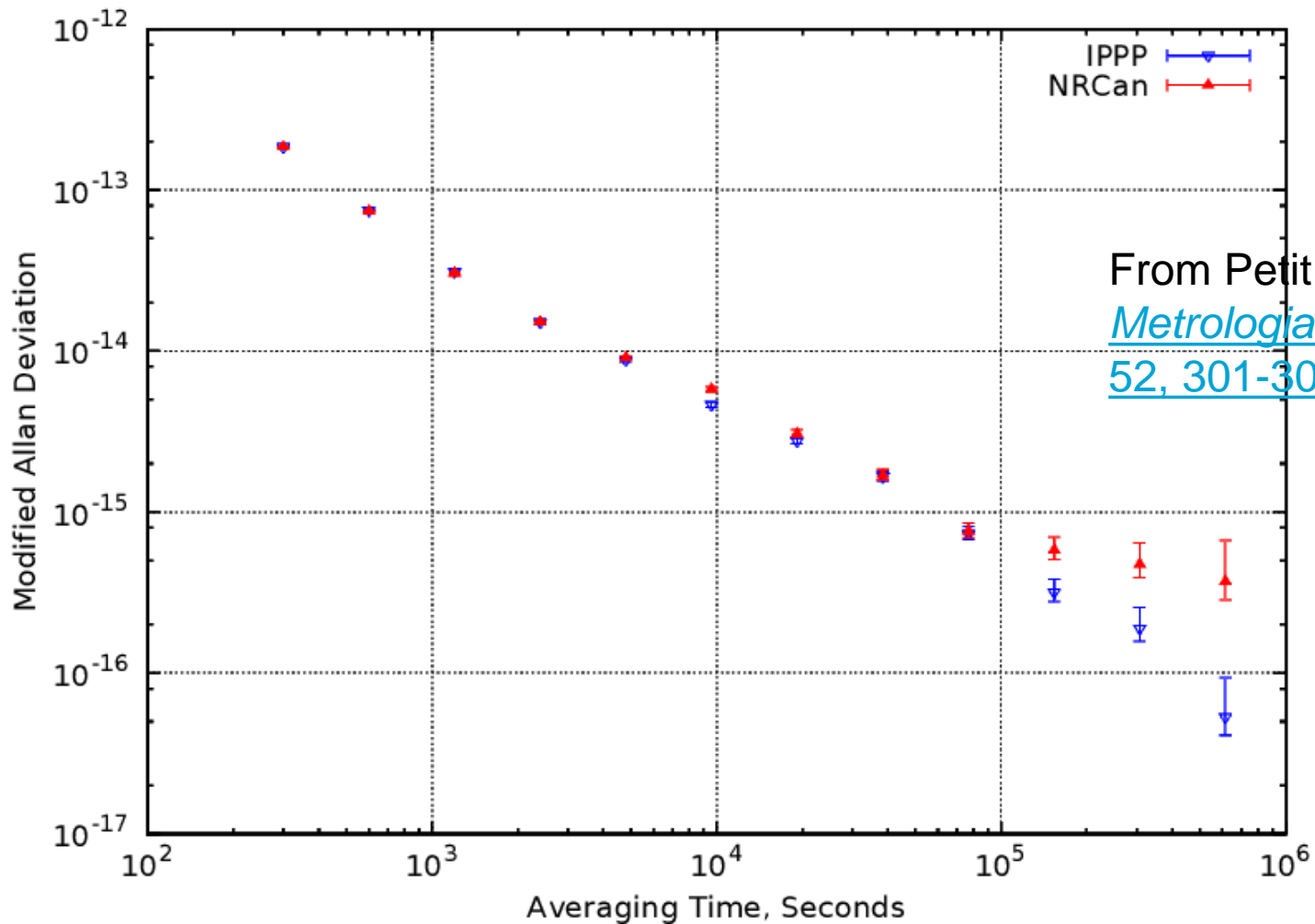






Classical Continuous PPP (NRCAN PPP)

Daily Integer PPP



From Petit et al.
[Metrologia, 2015, 52, 301-309.](#)

New constellations



GLONASS

GALILEO

BEIDOU

- More satellites → improves the precision