

March 19th 2008, A. Pany

Clock comparison with PPP KF

Specifications:

schedule: st16uni_45_9_230X_1_5
software: PPP KF
zwd: Vienna turbulence (standard)
clk: random walk + integrated random walk, ASDs: 2e-15 @ 15, 2e-15 @ 50
1e-14 @ 50, 5e-14 @ 50
wn: 4/sqrt(2), 8/sqrt(2) and 12/sqrt(2) ps per station

zwd: random walk, 0.7 ps²/s
SH: SH11, random walk, 0.01 ps²/s
clk: deterministic rate + random walk offset, var. rate for offset: 1 ps²/s

elevation dependent downweighting as proposed by J. Gipson:

$$\text{sig}^2 = \text{obs_sig}^2 + (10\text{ps}/\sin(\text{el}))^2$$

A comparison on the impact of clock accuracy was carried out using the four different clocks specified above. The comparison was performed using 3 different wns: 4/sqrt(2), 8/sqrt(2) and 12/sqrt(2) ps.

The same time series of turbulent equivalent zenith wet delay and the same white noises were used for the comparison, differences in the rms values are thus only due to clock.

In short conclusion it can be said that results for the clock with an ASD of 5e-14 @ 50 min are significantly worse, the results for the three other clocks do not differ significantly.

Clock comparison for a white noise of $4/\sqrt{2}$ ps

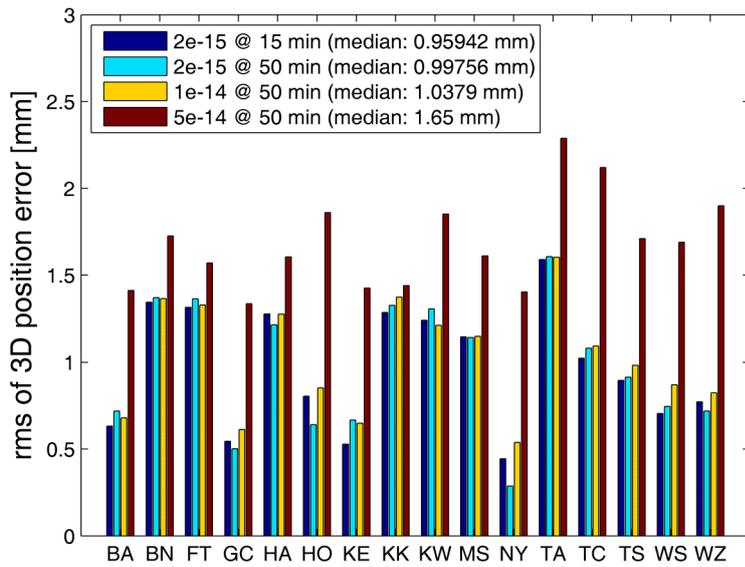


Figure 1a rms of 3D position error

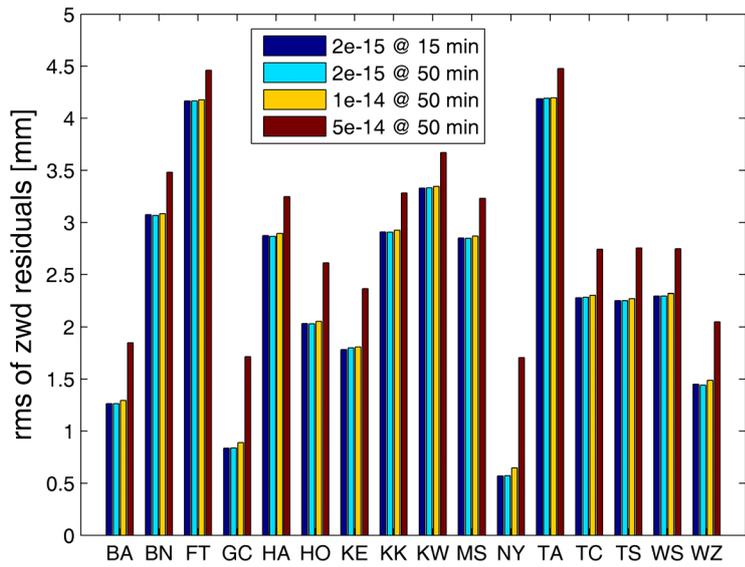


Figure 1b mean rms of zwd residuals

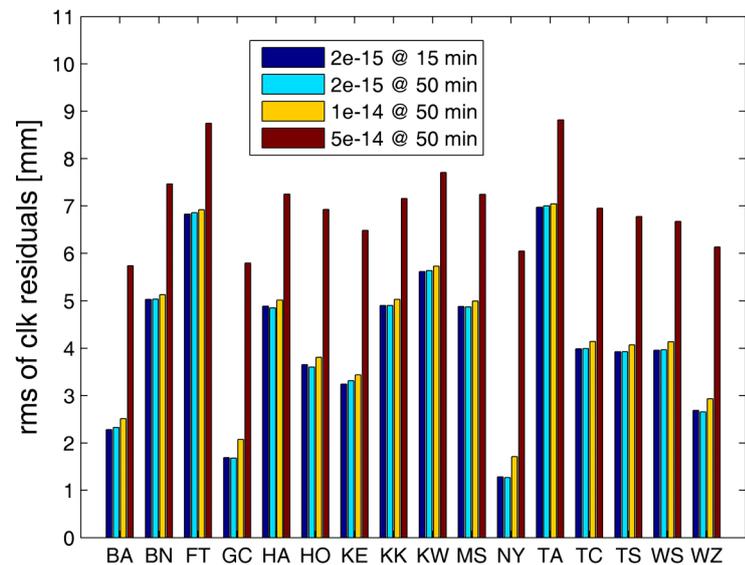


Figure 1c mean rms of clk residuals

Clock comparison for a white noise of $8/\sqrt{2}$ ps

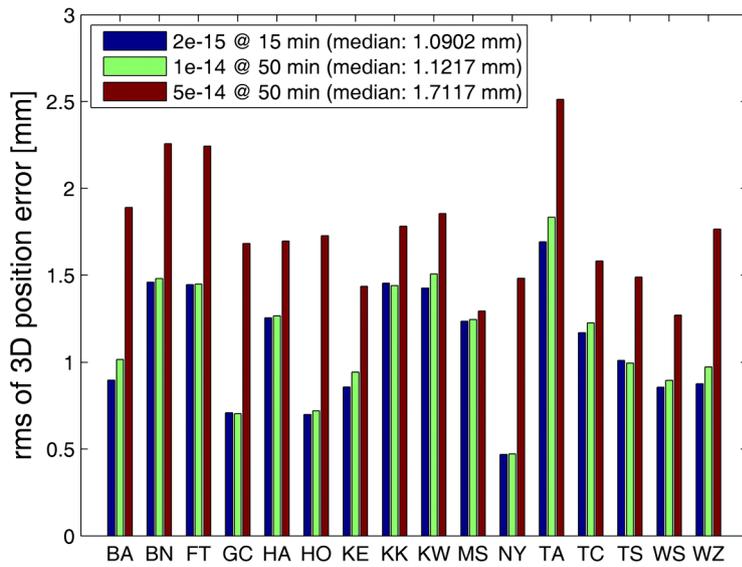


Figure 2a rms of 3D position error

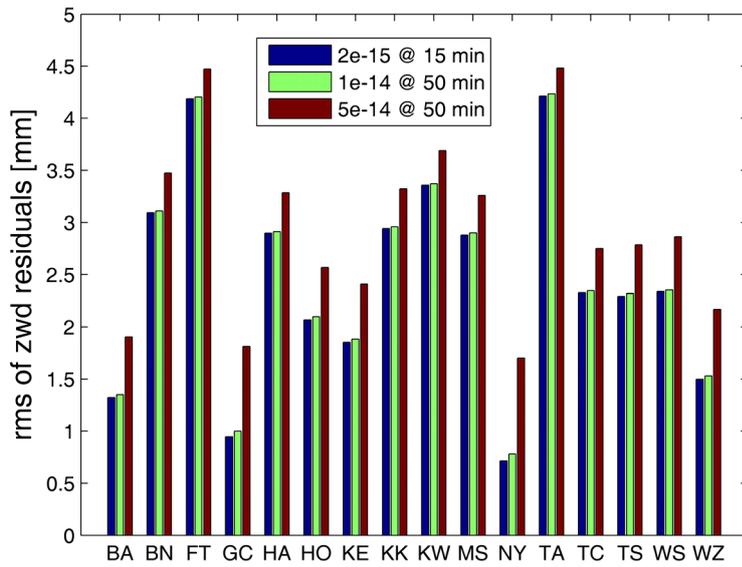


Figure 2b mean rms of zwd residuals

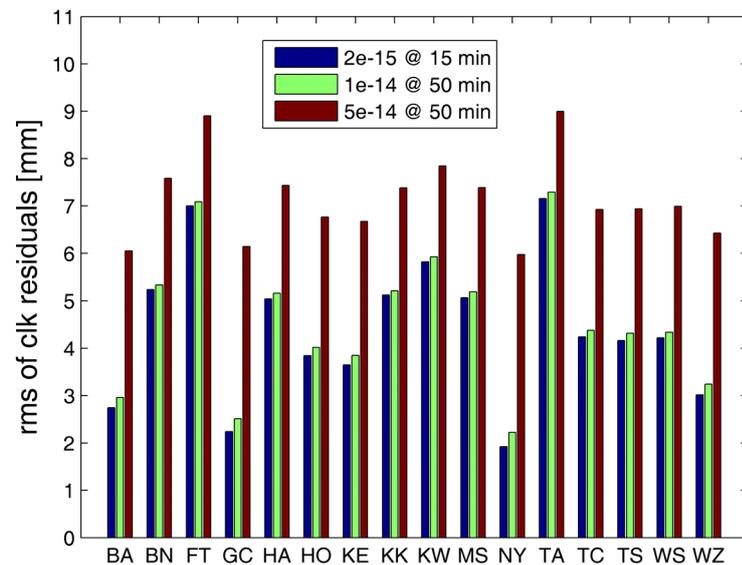


Figure 2c mean rms of clk residuals

Clock comparison for a white noise of $12/\sqrt{2}$ ps

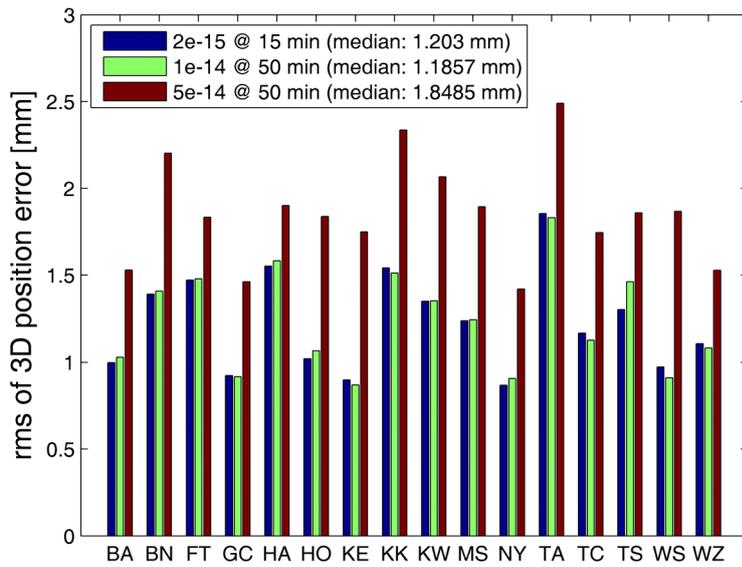


Figure 3a rms of 3D position error

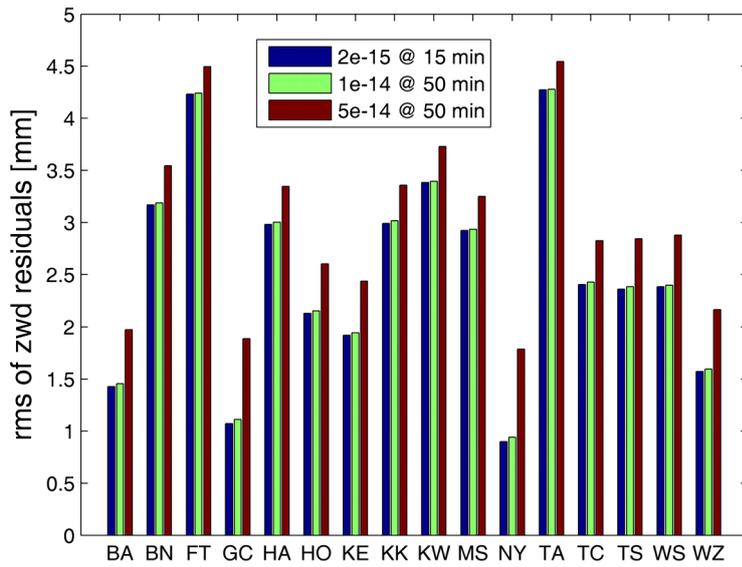


Figure 3b mean rms of zwd residuals

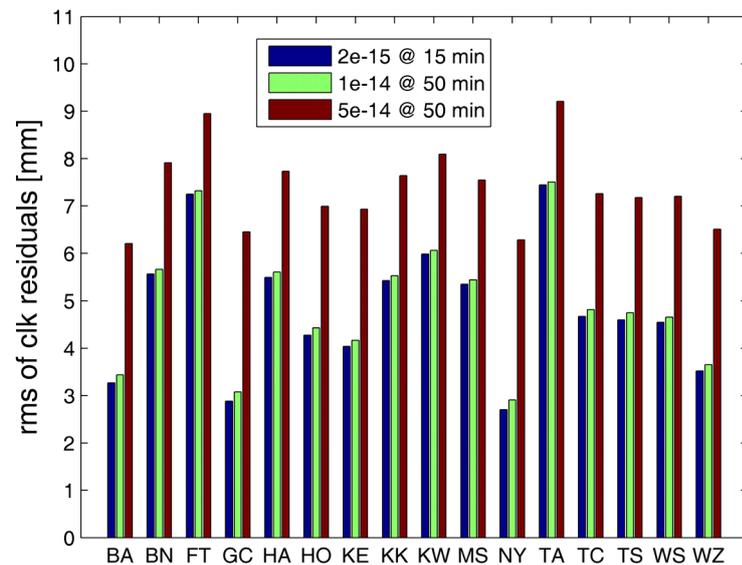


Figure 3c mean rms of clk residuals