Impact of Different Phase Center Correction Values on Geodetic Parameters: A Standardized Simulation Approach

- EGU General Assembly 2022 -

G1.2: High-precision GNSS: methods, open problems and Geoscience applications

Institut für Erdmessung

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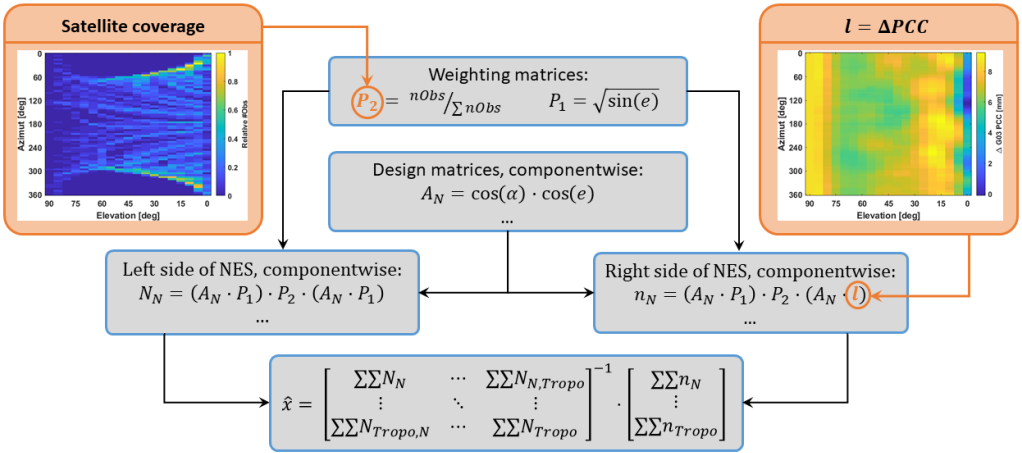
Standardized Simulation Approach



Processing Parameters

Antennas

PCC differences (ΔPCC) of individual calibrations between methods `Chamber` and `Robot`:

$$\Delta PCC = PCC_{Chamber} - PCC_{Robot}$$

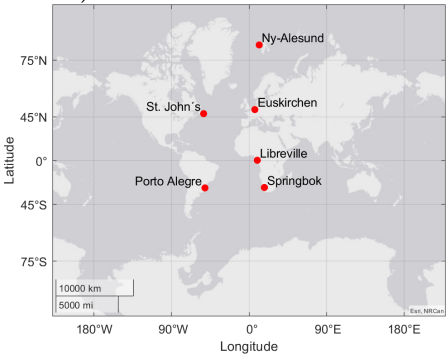
ID	Antenna name	Radom	Serial number
PCC1	LEIAR25.R3	LEIT	10170015
PCC2	TRM59800.00	NONE	5025353801

Settings

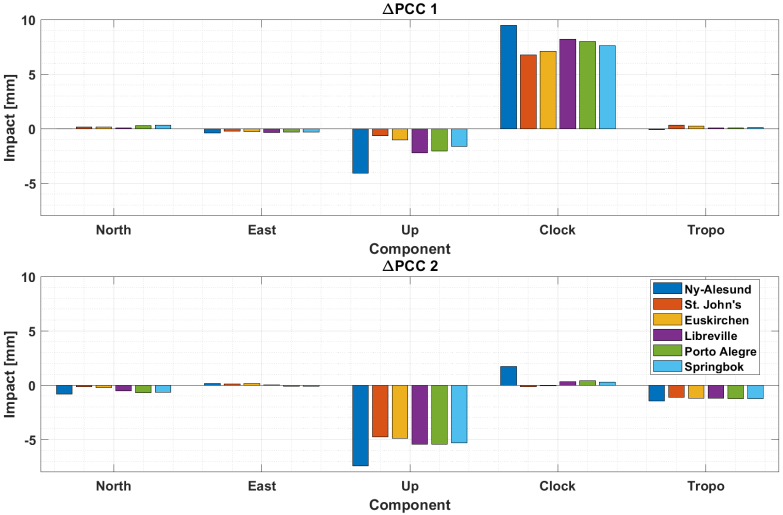
- Elevation cut-off angle: 5°
- Observation weighting: sin(elev)
- Frequency: GPS L0
- Time period: May, 1st 2022 (24 h, Δt = 5 min)

Geographic Locations

Six globally distributed stations (part of EPN/IGS network)

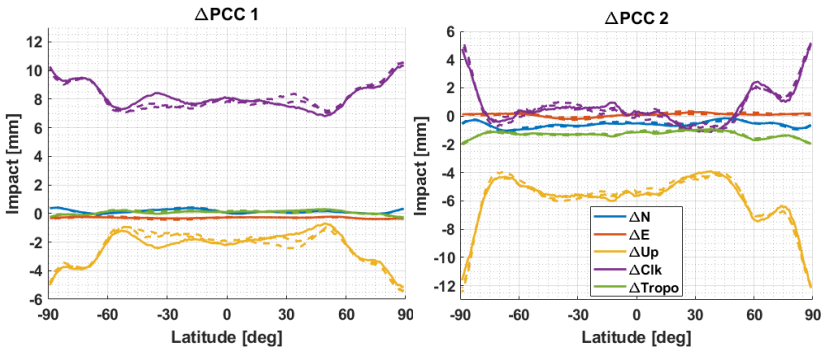


Impact on Geodetic Parameters



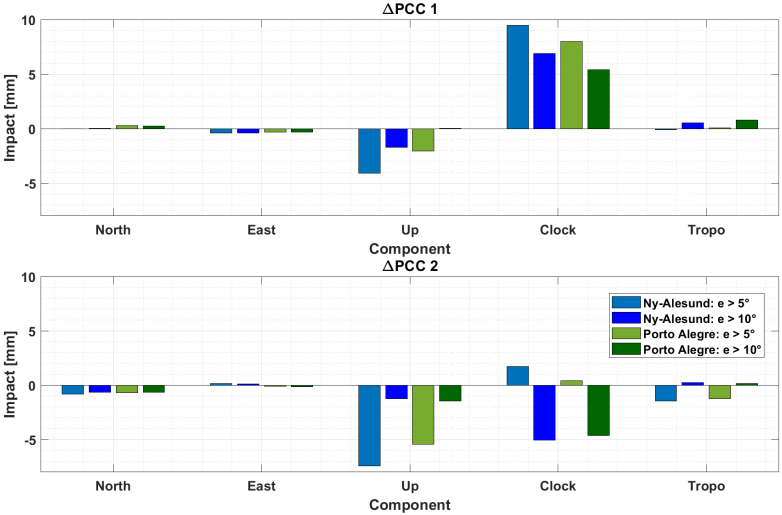
- Highest impact on Up-component and receiver clock error
- Deviations of horizontal components and tropospheric parameter $< \pm 2\,\mathrm{mm}$
- Station-dependency independently of ΔPCC observable

Variation of Latitude



- Impact calculated for prime meridian (solid lines), 1° latitude resolution
- High impact of ΔPCC on Up-component and receiver clock error, correlation clearly observable
- Deviations increase near to poles
- Small variations at different longitudes ($\pm 45°$), indicated by dashed lines

Variation of Elevation Cut-Off Angle



- Change of elevation cut-off angle e from 5° to 10°
- Impact of ΔPCC on Up-Component decreases significantly, accordingly change of receiver clock

→ **Processing parameters & geographic location highly influence the impact of ΔPCC on geodetic parameters!**

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