

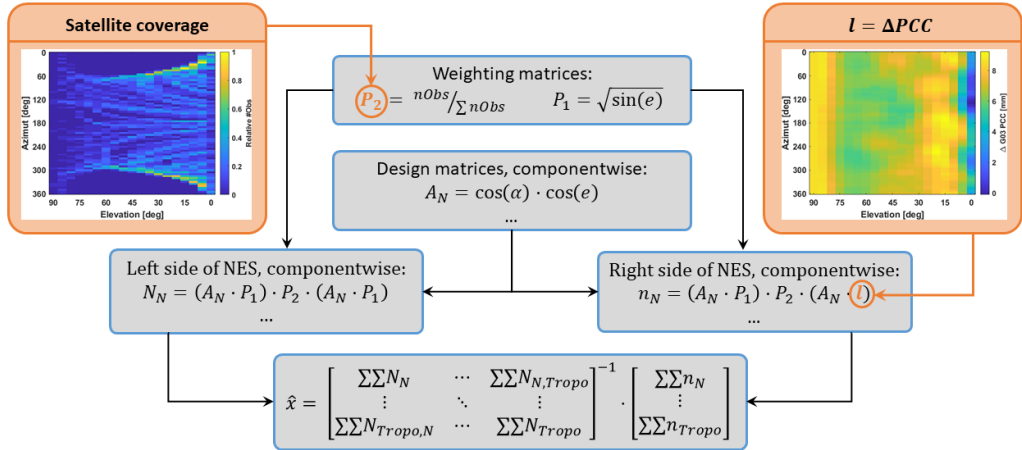
Impact of Different Phase Center Correction Values on Geodetic Parameters: A Standardized Simulation Approach

- EGU General Assembly 2022 -

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

Institut für Erdmessung
Gottfried Wilhelm Leibniz Universität Hannover

Standardized Simulation Approach



Processing Parameters

Antennas

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

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

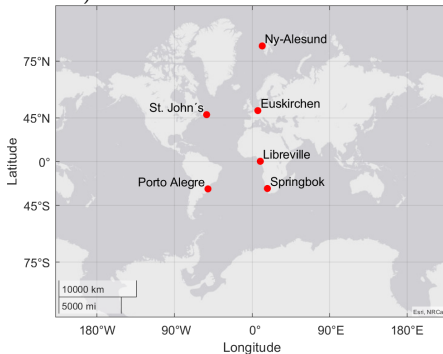
ID	Antenna name	Radom	Serial number
PCC1	LEIAR25.R3	LEIT	10170015
PCC2	TRM59800.00	NONE	5025353801

Settings

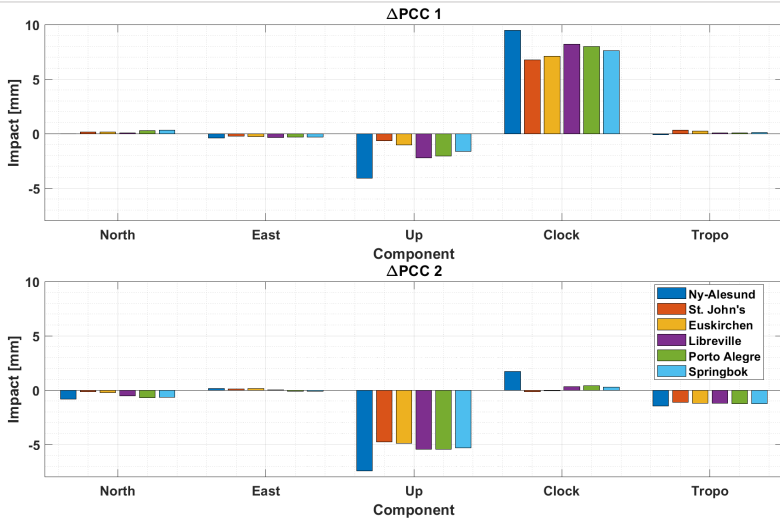
- ▶ Elevation cut-off angle: 5°
- ▶ Observation weighting: $\sin(\text{elev})$
- ▶ Frequency: GPS L0
- ▶ Time period: May, 1st 2022 (24 h, $\Delta t = 5$ min)

Geographic Locations

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

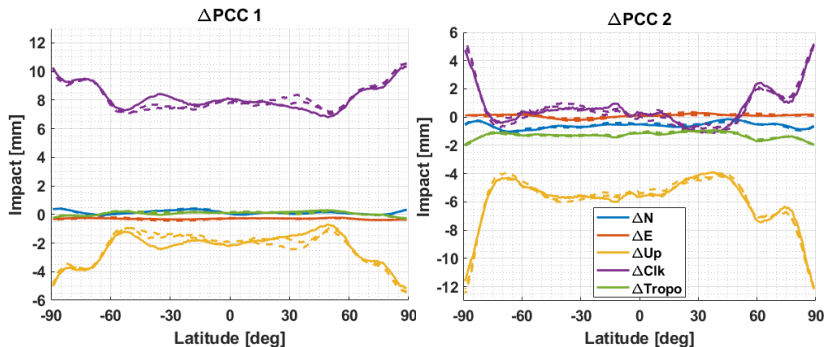


Impact on Geodetic Parameters



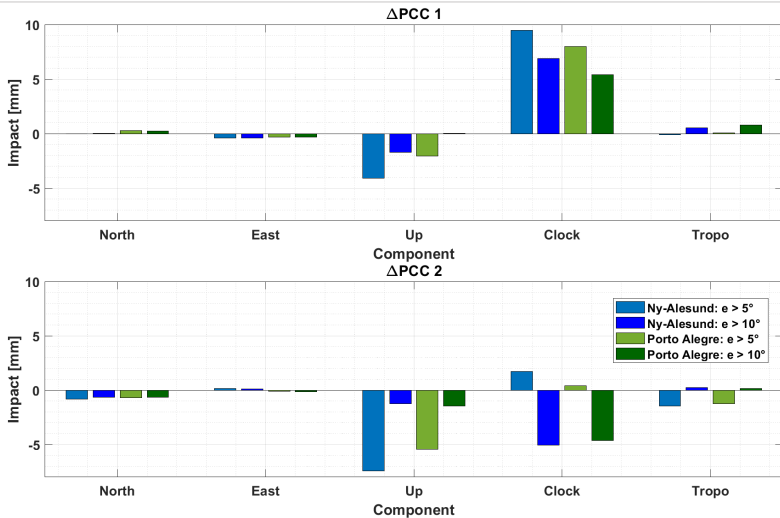
- ▶ Highest impact on Up-component and receiver clock error
- ▶ Deviations of horizontal components and tropospheric parameter $< \pm 2$ mm
- ▶ Station-dependency independently of Δ PCC observable

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 ($\pm 45^\circ$), 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!**

Johannes Kröger
Institut für Erdmessung
Schneiderberg 50
D-30167 Hannover, Germany
phone +49 - 511 - 762 17693
fax +49 - 511 - 762 4006
web <http://www.ife.uni-hannover.de>
mail kroeger@ife.uni-hannover.de

