

IGS PPP-AR WG Meeting

Impact of PCO on biases

16 September 2021

Issue to be discussed

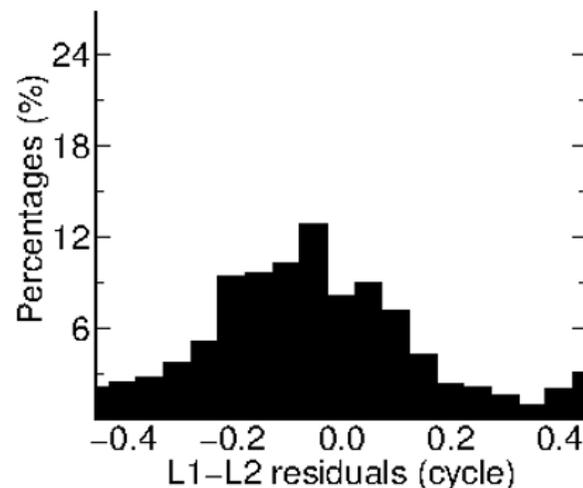
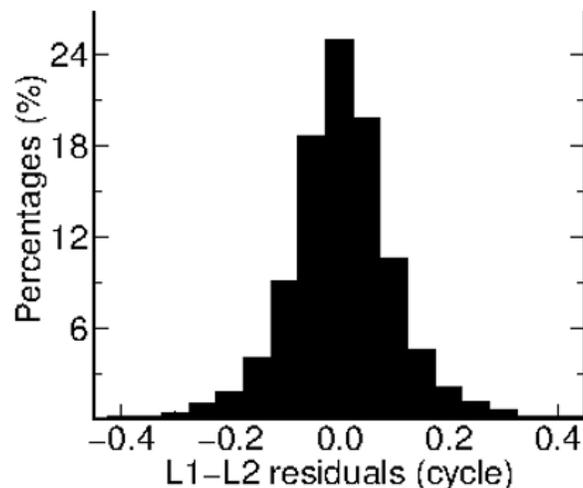
- GPS III, Galileo and BeiDou satellites have different phase center offsets (PCO) for each frequency
- Consequently, the widelane (Melbourne-Wubbena) biases and the DCB will be different whether the AC applied PCO corrections or not
- Currently, most analysis centers do not apply PCO corrections when computing biases (except WHU and TUG)
- To ensure consistency at the user end, it is suggested that analysis centers apply PCO corrections

Results from Wuhan University

Impact of PCO-relevant wide-lane bias on uncombined PPP

- MW combinations ignoring PCOs are incompatible with uncombined PPP
 - We calculated OSBs using Galileo MW combinations with/without PCO corrections;
 - We then carried out uncombined PPP and resolve wide-lane (N1-N2) ambiguities;

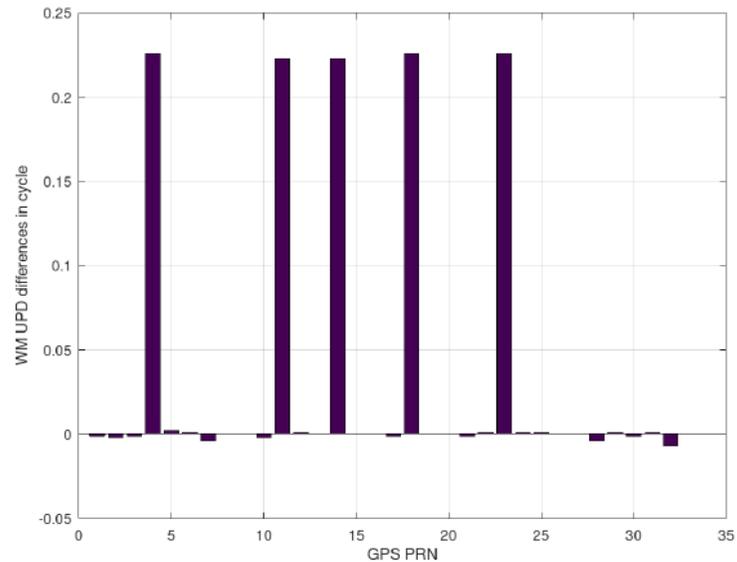
WL phase bias with PCO corrections 75.9% within ± 0.1 cycle lan WL phase bias without PCO corrections 39.1% within ± 0.1 cycle



武汉 2021年5月22日

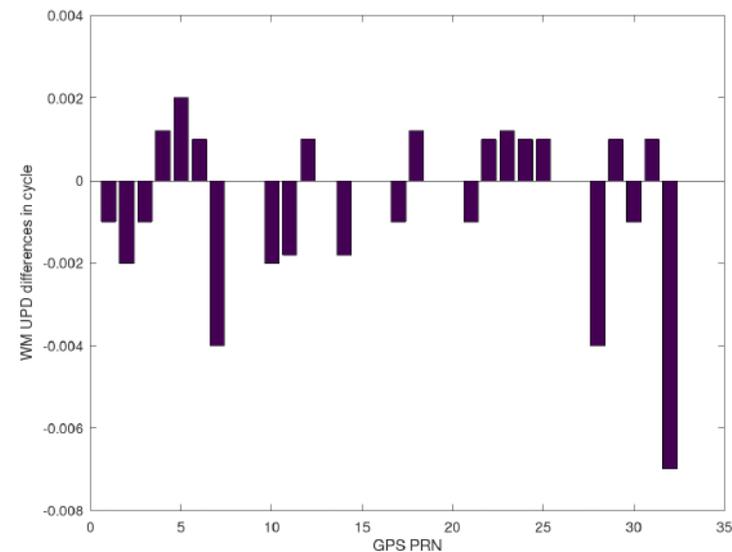
Results from GFZ

GPS WM UPD with and without PCO/PCV(from sat&sta) correction



- GFZ0MGXRAP for DOY 245 in 2021;
- Two groups: GPS III and other satellites;
- 5 GPS III satellites WM UPD differences show a mean bias of 0.225 ± 0.0016 cycle.

After remove the GPS III bias, the STD of the differences is reduced to 0.0018 cycle.



Points for discussion

- Should geometry-free biases be corrected for PCO?
- If yes:
 - How do we handle the discontinuity in biases?
 - How do we handle the backward consistency?
- If no:
 - How do we handle the transformation to observable specific biases (OSB) in the Bias SINEX format?
 - Do we need to create flags that indicate if PCO corrections were applied to biases?