



## **Assessing the performance of horizontal troposphere gradients derived from NWM**

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Consideration of horizontal troposphere gradients is of significant importance when wanting to achieve highest possible precision in modeling the tropospheric path delay in space geodetic techniques such as Very Long Baseline Interferometry (VLBI) and Global Navigation Satellite Systems (GNSS). In particular for observations at low elevation angles, considering horizontal gradients is indispensable. The commonly accepted strategy is to always estimate these gradients in the data analysis. However, recent studies have pointed out the capability of deriving gradients from numerical weather models (NWM) and using them as a priori values in the analysis. The a priori gradients GRAD by Landskron and Böhm (2018) achieve to improve the baseline length repeatability of about 90 % of VLBI sessions from 2006 to 2014 as against estimating the gradients. In this presentation, we compare different NWM-derived gradients against those estimated in the VLBI analysis and discuss advantages and disadvantages of either of them. In addition, we also include empirical gradients from the Global Pressure and Temperature 3 (GPT3) model in the comparison.