EGU21-6615
https://doi.org/10.5194/egusphere-egu21-6615
EGU General Assembly 2021


# Line of Sight Refractivity from a standalone GNSS Receiver and Collocated Radiosonde data

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With its high temporal resolution, unique mesoscale sampling scale and full weather capability, GNSS is now contributing as an important tool for monitoring the global atmospheric environment. The GNSS tropospheric zenith delay and the corresponding precipitable water vapor data (PW) are already widely applied in many weather models. High precision GNSS processing also estimates tropospheric delay gradients, which contain azimuthal isotropic information about the state of the atmosphere. However, the application of GNSS tropospheric delay gradients is not yet fully explored because of several obstacles. First, it suffers from the satellite constellations geometry and multipaths, and the gradients estimations are noisier than the zenithal delays. Second, the delay gradients were first developed for positioning purposes. GNSS tomography takes advantage of the delay gradients but requires a dense GNSS network. Here we introduce a new method to obtain the line-of-sight wet refractivity from a stand-alone GNSS receiver. We assume that the wet refractivity is mainly governed by a scale height (exponential law) and that the departures from the decaying exponential can be mapped as a set of low degree 3D Zernike functions and Chebyshev polynomials. We show up examples of inversion with data acquired at the IGS station in Tahiti, French Polynesia. We will also discuss the possibility of joint inversions with other measurements, using radiosonde data as an example.