



## **Interest of GNSS tomography for nowcasting in the frame of HyMeX**

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HyMeX (HYdrological cycle in the Mediterranean EXperiment) aims at a better understanding and quantification of the hydrological cycle and related processes in the Mediterranean, notably with emphasis on high-impact weather events.

This study investigates the interest of GNSS tomography for nowcasting. For this purpose, the 3D fields of total and wet refractivity, and of water vapour density are retrieved (resolution of 10 km and 0.5 km, respectively horizontally and vertically) for 23 days of Autumn 2012, covering 6 intensive observation periods during severe weather events. An optimal strategy in tomography process developed in the frame of the COST action ES1206 (GNSS4SWEC - Advanced Global Navigation Satellite Systems tropospheric products for monitoring severe weather events and climate) is used for the permanent GNSS network considered (about 130 stations with a mean baseline of 30 km) and validated using external observations (ground-based Raman lidar and airborne Léandre II lidar, profiles from GNSS radio-occultations). The sensitivity to the model a priori, which is needed to initialize the tomographic retrievals, is investigated by considering both analyses and very-short-term (3-h) forecasts from a high resolution numerical weather prediction system (i.e. the 3DVAR data assimilation system AROME-WMED; its domain covers the western Mediterranean area and additional observations available during HyMeX field campaigns are assimilated). The additional information provided by GNSS tomography in comparison to these forecasts is presented.