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COST Action ES1206: Advanced GNSS Tropospheric Products for Monitoring Severe Weather Events and Climate (GNSS4SWEC)

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GNSS is a well established atmospheric observing system which can accurately sense water vapour, the most abundant greenhouse gas, accounting for 60-70% of atmospheric warming. Water vapour observations are currently under-sampled in operational meteorology and obtaining and exploiting additional high-quality humidity observations is essential to improve severe weather forecasting and climate monitoring. Inconsistencies introduced into long-term time series from improved GNSS processing algorithms make climate trend analysis challenging. Ongoing re-processing efforts using state-of-the-art models are underway which will provide consistent time series' of tropospheric data, using 15+ years of GNSS observations and from over 600 stations worldwide. These datasets will enable validation of systematic biases from a range of instrumentation, improve the knowledge of climatic trends of atmospheric water vapour, and will potentially be of great benefit to global and regional NWP reanalyses and climate model simulations (e.g. IPCC AR5)

COST Action ES1206 is a 4-year project, running from 2013 to 2017, which has coordinated new and improved capabilities from concurrent developments in GNSS, meteorological and climate communities. For the first time, the synergy of multi-GNSS constellations has been used to develop new, more advanced tropospheric products, exploiting the full potential of multi-GNSS on a wide range of temporal and spatial scales - from real-time products monitoring and forecasting severe weather, to the highest quality post-processed products suitable for climate research. The Action has also promoted the use of meteorological data as an input to real-time GNSS positioning, navigation, and timing services and has stimulated knowledge and data transfer throughout Europe and beyond.