**Motivation**

The objective of this work is to show the interest of GNSS for weather forecasts, especially for nowcasting. We focus on GPS observations (post-processing and sub-hourly solutions) with a time resolution of 15 to 5 minutes.

**Monitoring of the humidity field by GNSS observations**

**Improvement of IWV 2D field by GNSS gradients**

Using combined IWV$_{post}$ and gradients, the monitoring of the humidity field. The meteorological situation and the location of water vapour blobs observed by GNSS show a good agreement with radar precipitation.

**Local water vapour anisotropy monitoring by GNSS slant obs.**

Using slant delay in direction of GNSS satellites, forecasters can monitor in near real-time the local anisotropy induced by water vapour around a station.

**Use of new products for nowcasting**

**NRT indicator of deep convection based on dry/wet contrast**

A meticulous observation of ZTD and gradients time-series have shown that a typical configuration (dry/wet contrast) can be observed before initiation of deep convection.

For the rainfall event of 28-29 June 2005, the successful rates of our alert are 76.4% (post-processing) and 66.5% (sub-hourly solutions); (Brenot et al. 2013, ACP).

**NRT indicator of tropospheric activity based on Ionosphere-Free Double Difference (IF-DD)**

For each station of a dense network (30 km x 30 km), the baselines between neighbouring stations have been considered to assess IF-DD indexes. These indexes can be used to monitor the tropospheric activity.

**Potential use of GNSS tropospheric tomography**

Using a priori from ALARO model, the potential use of GNSS tropospheric tomography has been studied (storm, 18 October 2011). Strong rainfalls induced a flood event in Brussels at 12PM. Three hours after, the storm threatened the Belgium’s Pukkelpop music festival and killed five after stage collapses.