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Impact of Moroccan ground-based GPS ZTD data assimilation on precipitation events forecast

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In the recent years, with the development of data assimilation techniques, Global Positioning System (GPS) data is directly assimilated in numerical weather prediction (NWP) to improve the model initial conditions. Former studies have assessed the impact of assimilating GPS observations on the forecast of heavy precipitations [1].
In this context, a ground-based GPS network has been implemented in Morocco by the National Meteorological Service since 2012. The raw data are processed locally to produce tropospheric variables in near-real time. The accuracy of GPS Zenith Total Delay (ZTD) observations has been evaluated and proved by comparing with radiosonde measurements. In addition, a monitoring was performed to characterize ZTD error statistics required by the assimilation process.
The aim of this work is to investigate the impact of ZTD assimilation on the prediction of heavy precipitation events over Morocco using observing system experiments in addition with local observations. This was carried out for both ALADIN/Morocco and AROME/Morocco models using the three-dimensional variational data assimilation scheme (3D-Var). Generally, ZTDs tend to increase relative humidity in the model at the pressure levels that were analyzed. Other results will be discussed.

References

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