



Comparison of WRF model with GNSS tropospheric products during intense precipitation events in Bulgaria

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Predicting the formation and development of vigorous thunderstorms producing heavy rain and hail is a complex process which among other environmental conditions depend on accurate estimation of water vapor distribution in space and time. The goal of this study is to evaluate the NWP WRF model skills for predicting the temporal and spacial variability of integrated water vapor (IWV), during intense precipitation cases in Bulgaria in 2012, using GNSS-IWV from 30 stations. For this purpose 22 cases of intense precipitation are selected, both frontal and convective. Evaluated is the diurnal IWV cycle, using data with temporal resolution of 15 minutes. In the frontal cases the WRF model underestimates IWV by up to 3 – 5 mm ($\sim 15\%$), with high correlation (0.75 – 0.93). In some cases WRF underestimates IWV by up to 6 – 7 mm ($\sim 30\%$) with poor correlation. For the well developed atmospheric fronts the IWV variations are well presented by the model.