



Use of GNSS tropospheric products to study the foehn in Sofia

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Foehn is a warm and dry wind that blows on the leeward side of the mountain and is a well-known example of local atmospheric circulation. In addition, foehn wind is an extreme weather event and forecasting extreme weather events is an important task for the short-term weather forecasts as it can result in large economic losses. The foehn in Bulgaria is observed on the northern slopes of the mountains, as a result of advection of warm air from the south and southwest. Its occurrence is highest north of the Vitosha mountain and north of the Balkan mountains. In this work we use GNSS tropospheric products in combination with surface observations to study the foehn events in Sofia for the period 2003-2014. In our study the surface temperature changes are compared to the Integrated Water Vapour (IWV) variation before, during and after the foehn events. The results show that decrease of IWV with the foehn onset is observed mainly during the foehn events with duration one to four days. In most cases a time delay in IWV decrease is observed. The location of the GNSS station is identified as the main reason for the delay in registration of the new air mass associated with foehn event. The foehn events are characterised with very high sensitivity and the GNSS station is located in the hilly area outside of Sofia city. It is planned to complement the study using the newly installed GNSS station at the Sofia University and also conduct numerical simulations with the Weather Research and Forecasting model.