



Study of fog dynamics in Bulgaria with the GNSS tropospheric products

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The fog formation, development and dissipation are studied by employing the synergy between surface observations and vertically Integrated Water Vapour (IWV) from Global Navigation Satellite Systems (GNSS). Selected are fog cases in 2012 and fog dynamic in Bulgaria is studied. It is found that the IWV tends to decrease during fog formation and densification. Increase of IWV leads to fog dispersion and can be a result of evaporation or advection of new humid air mass. The mixing ratio also decreases during the fog formation and increases during dissipation but has a distinct diurnal variability, which limits its nowcasting potential. IWV is found to have a very high sensitivity to both air mass transformation and/or advection at altitude. In one case it is found that the arrival time of a new air mass at altitude is of key importance for further fog development or suppression. The change of the air mass leads to change of the diurnal cycle of surface parameters like temperature thus controlling the fog life cycle. Further complication of fog diagnosis is introduced by a dynamic component, reflecting the topography difference in west and east part of Bulgaria. For monitoring fog dynamics hourly or sub hourly data-sets will be an advantage.