



## **Prediction of a winter fog event in Istanbul using WRF Model**

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On 19-20 February 2014, a dense cold advection fog affected the entire metropolitan city of Istanbul, Turkey. The fog event, which developed at around midnight, began to intensify after 5 am, and decreased the horizontal visibility conditions to 250m at Ataturk and to 100m at Sabiha Gokcen International Airports. The two-day continuity of this fog layer negatively affected the social life and caused many delays and cancellations in the air and sea transportation. In order to make better predictions of such events, it is certainly necessary to improve our understanding of the background atmospheric mechanisms that trigger fog formation in Istanbul. Therefore, in this study we investigate the role of synoptic and meso-scale atmospheric conditions of this extraordinary two-day winter fog event. As a consequence of the movement of high-pressure center from southern Turkey to the central parts with its 1026-hpa core, the relatively warm and humid air is transferred from over the cooler Sea of Marmara to the city by southerly air flow. The saturated air layer between surface and 925-hpa level prevented the incoming solar radiation reaching to the surface. The calm conditions at the surface also made the dissipation of the dense and thick fog layer difficult.

In order to better investigate this atmospheric event, we used WRF model by performing different sensitivity simulations. We forced the model with ERA-Interim data which has 0.75 by 0.75 degrees horizontal resolution and 38 vertical levels for MYNN 2.5 and Kain-Fritsch schemes used for PBL and Cumulus parameterization, respectively. First sensitivity simulations are conducted to understand the influence of the microphysics schemes on fog simulations. Thus, WRF model is run with Thompson, Milbrant, WSM6 and Morrison microphysics schemes. Preliminary results show that visibility simulated by the model has almost similar diurnal behavior with observations, however increasing and decreasing hours differ from the observations at both Ataturk and Sabiha Gokcen International airports. Meanwhile, it seems that the modeled fog is not as dense as the observations. This study is still in progress. Further investigation will be conducted on the effects of different PBL schemes and horizontal resolution changes on this fog event.