



Evaluation of operational numerical weather predictions in relation to the prevailing synoptic conditions

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The Thessaly plain, which is located in central Greece, has a vital role in the financial life of the country, because of its significant agricultural production. The aim of DAPHNE project (<http://www.daphne-meteo.gr>) is to tackle the problem of drought in this area by means of Weather Modification in convective clouds. This problem is reinforced by the increase of population and the water demand for irrigation, especially during the warm period of the year. The nonhydrostatic Weather Research and Forecasting model (WRF), is utilized for research and operational purposes of DAPHNE project. The WRF output fields are employed by the partners in order to provide high-resolution meteorological guidance and plan the project's operations. The model domains cover: i) Europe, the Mediterranean sea and northern Africa, ii) Greece and iii) the wider region of Thessaly (at selected periods), at horizontal grid-spacings of 15km, 5km and 1km, respectively, using 2-way telescoping nesting. The aim of this research work is to investigate the model performance in relation to the prevailing upper-air synoptic circulation. The statistical evaluation of the high-resolution operational forecasts of near-surface and upper air fields is performed at a selected period of the operational phase of the project using surface observations, gridded fields and weather radar data. The verification is based on gridded, point and object oriented techniques. The 10 upper-air circulation types, which describe the prevailing conditions over Greece, are employed in the synoptic classification. This methodology allows the identification of model errors that occur and/or are maximized at specific synoptic conditions and may otherwise be obscured in aggregate statistics. Preliminary analysis indicates that the largest errors are associated with cyclonic conditions.

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