A synoptic, dynamic and energetic study of a baroclinic depression that affected the area of Cyprus on 6^{th} November 2005

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The area of Cyprus is affected by baroclinic depressions mainly during the cold months. The knowledge concerning the evolution of these synoptic-scale cyclonic systems is useful for the better understanding of the underlying dynamic mechanisms, energetic conversions and physical processes associated with them.

The present study concerns the development and evolution of a baroclinic depression which affected the area on the 6^{th} of November 2005. The phenomena associated with this depression were thunderstorms, a waterspout reported over the southern coasts of Cyprus and high precipitation accumulations over the whole island, which resulted in an impounding of around 40% of the mean monthly precipitation.

The synoptic and several dynamic and energetic characteristics concerning the development and evolution of this depression were examined and a semi-Lagrangian approach was used in order to present the results. More specifically, the dynamic parameters of relative vorticity, divergence of the horizontal wind vector and a static stability index where calculated at the isobaric levels of 850, 500 and 300hPa for the period from the 4^{th} until the 8^{th} of November 2005. For the same period zonal and eddy available potential energy, zonal and eddy kinetic energy, boundary energy transfers and energy conversions were also calculated.

Satellite and weather radar observations are discussed, while an attempt was made to cross check the precipitation as measured accumulation from rain gauges and estimation based on weather radar reflectivity.

The data used for the mathematical calculations were NCEP/NCAR global analyses for 0000UTC, with a grid of 2.5^ox2.5^o. The calculations covered the area bounded by the meridians 20ºW and 50ºE and the parallels 20ºN and 65ºN.