Exploring the formation and dissipation of radiation fog from observational data and numerical model results (WRF and HARMONIE)

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Fog is a troublesome phenomenon that can affect the human activities and their safety. In many places around the world, radiation fog is the most common type of fog. This study focuses on an synoptically stable period comprising from 18 January to 28 January 2016 in the Spanish Northern plateau. During this period, several radiation-fog events were detected from observational data installed at the Research Centre for the Lower Atmosphere (CIBA), including a wide variety of characteristics: daytime-persistent fog, late-afternoon cloud-base-lowering (CBL) fog, deep and shallow fog, etc. Thus, a characterization of the conditions before, during and at the dissipation stage of every fog event are deeply analysed observationally. Numerical weather prediction (NWP) models have normally problems simulating these phenomena, and their results partially depend on the commented fog features. Therefore, results from two numerical models (WRF and HARMONIE) have also been used to compare their skill simulating the different events, with special emphasis on the simulation of fog onset, fog dissipation and fog thickness.