



## **Cold outbreaks from Mistral wind in the Western Mediterranean basin**

Jordi Mazon (1) and David Pino (1,2)

(1) Department of Physics, Universitat Politècnica de Catalunya · BarcelonaTech, Catalonia, Spain, (2) Institute of Space Studies of Catalonia (IEEC-UPC), Barcelona, Catalonia, Spain

Cold outbreaks over the western Mediterranean basin (WMB) associated to northern synoptic flows are investigated. Cold air entering into this region usually comes from the Gulf of Lion and is associated to synoptic northwesterly flow known as Mistral or tramontana wind. Due to the orographic barrier that the Pyrenees and the Massif Central offer to this flow, it blows with a large speed blowing from the northwest to north-northeast, perpendicular to the coast of the Gulf of Lion. Sometimes these cold outbreaks form a density current when interact with the warmer and wetter air over the Mediterranean Sea air, being one of the primary causes of storms over some areas of the WMB (Jansà, 1987), and affecting the weather across the whole basin (Trigo et al., 1999; Campins et al., 2000). Associated to these density currents, clouds can form at the separation line between the cold outbreak and the warmer sea air. These clouds can move several hundreds of kilometers offshore during more than 24 hours forming an arc of clouds extending over several hundreds of kilometers.

A couple of events of density currents associated to cold outbreaks are investigated by using Meteosat images and WRF model simulations. In both events, a cloud arc is observed and simulated. The main features and dynamic of these density currents are presented.