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Identification and analysis of mountain waves in the northwest of the Iberian peninsula.

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Mountain waves are a kind of gravity waves generated by orography which play a fundamental role in the troposphere, due to their capacity to transport energy and momentum. Mountain waves appear on the lee side of the orographic barrier in presence of a statically stable atmosphere, so that the air displaced from its equilibrium level oscillates around it, producing wave activity. Several studies have related wave activity with significant amounts of supercooled Liquid Water Content (LWC), generating high risk of aircraft icing. In addition, under certain conditions, the energy transported can be released, producing turbulence. In fact, mountain waves were cited as the cause of numerous aviation accidents, and therefore, it is of great interest for aviation safety to detect and predict wave activity in mountainous areas.
The greatest inconvenience in the study of atmospheric waves is that currently, there is no reliable instrumentation capable of observing them directly, being only possible to detect their effects. Nevertheless, it is possible to improve the real time identification of this phenomena by a using combination of numerical models together with new observational systems.
The main objective of this work is explore the ability of several instruments (a ceilometer and a multi-channel microwave radiometer) installed in a mountain area in the northwest of the Iberian Peninsula, together with simulations developed by a high resolution numerical weather model to identify and forecast mountain waves.

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