



## **Low Clouds and Fog Characterization over Iberian Peninsula using Meteosat Second Generation Images**

Beatriz Sánchez and Gregorio Maqueda

Universidad Complutense de Madrid, Fac. CC. Físicas, Física de la Tierra, Astronomía y Astrofísica II, Madrid, Spain  
(beassanchez@gmail.com ; gmaqueda@ucm.es)

Fog is defined as a collection of suspended water droplets or ice crystals in the air near the Earth's surface that lead to a reduction of horizontal visibility below 1 km (National Oceanic and Atmospheric Administration, 1995). Fog is a stratiform cloud with similar radiative characteristics, for this reason the difference between fog and low stratus clouds is of little importance for remote sensing applications. Fog and low clouds are important atmospheric phenomena, mainly because of their impact on traffic safety and air quality, acting as an obstruction to traffic at land, sea and in the air. The purpose of this work is to develop the method of fog/low clouds detection and analysis on nighttime using Meteosat Second Generation data. This study is focused on the characterization of these atmospheric phenomena in different study cases over the Iberian Peninsula with distinct orography. Firstly, fog/low clouds detection is implemented as a composition of three infrared channels 12.0, 10.8 and 3.9  $\mu\text{m}$  from SEVIRI radiometer on board European geostationary satellite Meteosat (Meteosat-9). The algorithm of detection makes use of a combination of these channels and their differences by creating RGB composites images. On this way, it displays the spatial coverage and location of fog entities. Secondly, this technique allows separating pixels which are indicated as fog/low clouds from clear pixels, assessing the properties of individual pixels using appropriated thresholds of brightness temperature. Thus, it achieves a full analysis of the extent and distribution of fog and its evolution over time.

The results of this study have been checked by using ground-based point measurements available as METAR data. Despite the flaws in this sort of inter-comparison approach, the outcome produces to accurate fog/low clouds detection. This work encompasses the way to obtain spatial information from this atmospheric phenomenon by means of satellite imagery.