



A Subtropical Cyclone in the Canary Islands: the October 2014 event

Lara Quitian (1), María Luisa Martín (2), Juan Jesús González-Alemán (3), Daniel Santos-Muñoz (4), and Francisco Valero Rodríguez (1)

(2) Universidad de Valladolid, Escuela de Ingeniería Informática, Matemática Aplicada, Segovia, Spain (mlmartin@eii.uva.es), (1) Dpto. Astrofísica y Física de la Atmósfera. Facultad de Física. Universidad Complutense de Madrid. Ciudad Universitaria s/n. 28040 Madrid. Spain. , (3) Instituto de Ciencias Ambientales. Universidad de Castilla-La Mancha. Avda. Carlos III s/n. 45071 Toledo. Spain., (4) Agencia Estatal de Meteorología. Leonardo Prieto Castro, 8. 28040 Madrid. Spain.

Depending on the thermal structure and dynamics, there are different types of cyclones in the troposphere. Subtropical cyclones (STC) are low pressure systems that share tropical and extratropical characteristics, having hybrid thermal structures. In October 2014, a cyclonic system landfall the Canary Islands, causing widespread damages. The system began to develop in October 18 and its effects lasted until October 21. Here, the diagnosis and identification of such cyclone as STC is carried out, examining its dynamical and thermal evolution. Diverse fields have been obtained from three different numerical models, and several diagnostic tools and cyclone phase space diagrams have been used. The cyclone evolved from a typical extratropical cyclone, detached from the atmospheric circulation which was highly meridional and became a stationary cut-off low. The meridional intrusion of the trough as well as a low-level baroclinic zone favored the formation of a STC northwestern of the Canary Islands. Several cyclone phase space diagrams are used to classify the cyclone as a STC, highlighting a deep cold core in its early stages that develops into a shallow warm core. High potential vorticity areas associated with the cyclone promoted strong winds and precipitation over the Islands. Throughout the event, an increased conditional instability is observed in the different soundings, leading to strong vertical wind shear. Moreover, relatively warm sea surface temperature is obtained, establishing the conditions to favor the organization of long-lived convective structures.