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Numerical modeling of a subtropical cyclone

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Subtropical cyclones are characterized by a hybrid structure because they share tropical and extratropical features, leading to great economic and social damage. Here, a subtropical cyclone formed between northwestern Canary Islands-southwestern Iberia is numerically analyzed by means of several numerical models. The large-scale conditions, able to establish a favorable thermodynamically and dynamically environment for the subtropical cyclone development, have been analyzed by means of the ECMWF Integrated Forecast System (IFS). On the other hand, the atmospheric instability during the system evolution has been analyzed by several fields obtained from the high-resolution mesoscalar HARMONIE model. The environment in which the cyclogenesis was developed has been studied through several tools that give information of the diagnosis of convective phenomena, obtained from the HIRLAM model. The interaction of a trough coming from the high latitudes and a low-level baroclinic zone favoured the formation of the subtropical cyclone, finally located near the Canary Islands. It is noticed an enhanced conditional instability through a deep troposphere layer. Long-lived convective structures are developed due to relatively warm sea surface temperature, field obtained from the WRF model, together with moderate to strong vertical wind shear.