



Birth of the Biscane

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This contribution describes the synoptic-dynamic development of the unprecedented storm "Stephanie" that exhibited tropical characteristics over the Bay of Biscay on 15 September 2016. Remote sensing observations reveal a cloud-free eye surrounded by a circular precipitation pattern and an axisymmetric wind field, while buoy observations show an abrupt drop in wind speed during the passage of the storm centre. Cyclone phase space diagrams, adapted to the specific characteristics of this storm, were calculated using ECMWF operational analyses and deterministic forecasts. Their analysis clearly corroborates the transition from a frontal cold-core to a symmetric warm-core system, often referred to as a "tropical transition". To the best of our knowledge, this is the first-ever documented case of this kind over the Bay of Biscay. The ECMWF deterministic forecast well predicted the tropical transition four days ahead.

By analogy with "Medicanes" (Mediterranean hurricanes), we name this storm a "Biscane" (Biscay hurricane). It is speculated that the tropical transition of Stephanie was fostered by anomalously high sea surface temperatures (SSTs) present in September 2016 over the Bay of Biscay. While these high SSTs are likely related to the prevalence of anticyclonic weather in the weeks preceding the storm, average SSTs over the Gulf of Biscay increased by about 1° C in the last 35 years and weather systems of this kind may become more frequent in a future warmer climate.