This study describes an event of heavy rainfall that took place in the Maresme region located in the northeastern coast of Barcelona province, in Catalonia. Catalonia coastal region is one of the most affected by flash-flood events and, in particular, the Maresme is the most impacted area as well as one of the most populated. As a consequence, the societal risk associated to this phenomenon is very high (Cuevas et al., 2010). During the summer and the beginning of autumn, lightly convective episodes usually occur in the western Mediterranean. The Catalan flash floods occur mostly during the autumn season. Generally these events are short-lived and may lead to sudden flooding of rivers born in the Pyrenees and also in coastal rivers (Pascual, 1989).

During 12-13 October 2016, an event of heavy and generalized rains took place all over the Catalan Peninsula. An instability line that moved across the Catalan coast during Wednesday 12th originated a thunderstorm with very heavy showers, even torrential rains, which persisted at some points of the Maresme region, accumulating more than 200 mm in several points in less than 8 hours. This very intense rain caused traffic and railroads cuts, power shortages, loss of cars parked at watercourses and, unfortunately, a man died trapped in his car at an underpass.

INTRODUCTION

The meteorological synoptic framework in south-western Europe on 12 October was governed by the passage of a cold front associated by a cold low centred at the north-west of Portugal. This front moved across the Catalan Peninsula following by very persistent instability lines. The passage of these fronts created continuous rainfall, with persistent and occasionally strong downpours at the south-east and centre of the Peninsula. Previous to the crossing of the front, the confluence of westerly Mediterranean trajectories originated an instability line that crossed the Catalan littoral during that evening causing the heavy, even torrential rains showers that affected the Maresme area.

SYNOPTIC AND MESOSCALE SETTING

The Mediterranean synoptic framework in south-western Europe on 12 October was driven by the passage of a cold front associated with a cold low centred at the north-west of Portugal. This front moved across the Catalan Peninsula following by very persistent instability lines. The passage of these fronts created continuous rainfall, with persistent and occasionally strong downpours at the south-east and centre of the Peninsula. Previous to the crossing of the front, the confluence of westerly Mediterranean trajectories originated an instability line that crossed the Catalan littoral during that evening causing the heavy, even torrential rains showers that affected the Maresme area.

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Cloudiness, Precipitating Systems and Thunderstorms

• Cloud band associated to westerly advancing cold front. Cloud-deepening from SW to NE. • Cumulonimbus cloud over northeast located at 90 km southeast over the sea. • Not very deep Cb. Difficult to identify. • Convective cell shows a clear radar velocity signature. • Cumulonimbus cloud over northeast located at 90 km southeast over the sea. • Not very deep Cb. Difficult to identify. • Convective cell shows a clear radar velocity signature. • Cumulonimbus cloud over northeast located at 90 km southeast over the sea. • Not very deep Cb. Difficult to identify. • Convective cell shows a clear radar velocity signature.