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Extreme precipitation events in the Mediterranean area. A contrasting Lagrangian and Eulerian approach for moisture evaporation sources identification.

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Concern about heavy precipitation events has increasingly grown in the last years in the South of Europe, especially in the Mediterranean region. These occasional episodes can result in more than 200 mm of rainfall in less than 24 h, producing flash floods with very high social and economic losses.

To improve their predictability, the correct identification of the origin of the moisture must be done. The Eulerian and Lagrangian models provide a good approach to detect moisture sources. However, they show some limitations.

Here, we present a comparison between both methods through a case study of an extreme precipitation event on the region of the Mediterranean coast which take place in 1982. Using the Lagrangian model FLEXPART-WRF to backtrack the moisture, we identify the evaporation sources. Then, we compare it with the results obtained through Eulerian WRF-WVT method [1]. Also, we evaluate the accuracy of E-P balance in contrast to Evaporation patterns. Finally, we implemented a further identification of moisture uptake method which enables us to directly compare results from both strategies [2].

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