



Propagation of precipitation downstream of mountain ranges within the Mediterranean Basin

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Endemic to the meteorology over the Mediterranean basin is the propagation of precipitation arising from different forcing mechanisms over the continental and sea regimes. This study examines the propagation properties of precipitation and the likely forcing mechanisms over the northern continental regime of the Mediterranean basin. This consists of: (1) the mountain elements of the Iberian Peninsula made up by the Cordillera Cantabrica to the north and the Sierra Moreno to the south, (2) the combination of the Central Massif and great ridge of Alps within southern Europe, (3) the Apennine escarpment along the Italian peninsula, and (4) the relief chain made up by the Dinaric Alps and Pindus Mountains throughout the Balkans and down into Greece. We now generally understand the mechanisms behind warm season precipitation propagation downstream of north-south aligned mountain ridges under either ambient westerly flow in the mid-latitudes or easterly flow in the subtropical-tropical zone, a process governed by both diurnally-driven mountain slope flow circulations and quasi-geostrophic driven advection of mesoscale convective systems (MCSs). The propagation properties of precipitation downstream of the continental mountain systems of the Mediterranean basin are not as clear-cut as those of the north-south aligned ridge systems we have studied, however they exhibit some of the features that we have already identified. Our findings will be discussed in the context of comparisons and contrasts between precipitation propagation processes of the Mediterranean basin's mountain systems and those of north-south aligned mountain ridges elsewhere. The data we have used to conduct this analysis arise from 3-hourly multi-satellite TRMM algorithm 3b42 rainrate estimates, which are based on combining rainrate estimates from a variety of passive microwave and infrared measurement sources, but all referenced to the narrow swath, calibration-quality TRMM combined PR-TMI algorithm 2b31 rainrate estimates.