



Characterization of extreme wave fields during Mediterranean tropical-like cyclones

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Mediterranean tropical-like cyclones (MTLC; Cavicchia et al., 2014) are mesoscale disturbances that manifest tropical-like characteristics, especially around the eye, with a morphology similar to tropical cyclones (TC; see Emanuel, 2005), without visible frontogenesis in the mature stage. In general, due to both the physical processes that intensify the cyclone and the region in which it develops, their ground structure varies considerably. Indeed, although tropical-like storms have also been observed in the Atlantic Ocean (Franklin et al., 2006) and Black Sea (Efimov et al., 2008), they occur predominantly in the Mediterranean Sea (and are therefore also known as Medicanes), particularly in the Ionian, the Balearic, and the Tyrrhenian sub-basins (see Patlakas et al., 2021), where the topography and coastal morphology play a key role in determining the near-surface wind fields and consequently the genesis and evolution of the wave fields, more frequently in late summer and autumn. Medicanes are rare compared to other cyclones (Cavicchia et al 2014) that occur in the Mediterranean Sea, since they originate in a baroclinic environment, albeit still requiring several atmospheric conditions to produce a barotropic environment, like warm core, spiraliforma clouds band, intense wind speed and well defined eye. The frequency of occurrence varies according to the type of MTLC considered: if only very strict criteria are adopted, ie only storms with fully tropical features (such as cloud structure, degree of symmetry, dimensions, and lifespan on satellite images), 0.5 events occur per year on average, while if hybrid structures are also included around 1.5 Medicanes per year occur (Cavicchia et al., 2014).