



Modelling Tropical Cyclones-Ocean interactions: the role of the Atmosphere – Ocean coupling frequency

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The interaction between Tropical Cyclones (TCs) and ocean is a major mechanism responsible for energy exchange between the atmosphere and the ocean. TCs affect the thermal and dynamical structure of the ocean, but the magnitude of the impact is still uncertain. Very few CMIP5 models demonstrated ability in representing TCs, mainly due to their horizontal resolution. We aim to improve TCs representation in next CMIPs experiments through the new CMCC-CM2VHR General Circulation Model, having a horizontal resolution of $\frac{1}{4}$ degree in both atmospheric and ocean components. The model is capable to represent realistically TCs up to Cat-5 Typhoons. A good representation of the TC-Ocean interaction strongly depends on the coupling frequency between the atmospheric and the ocean components. In this work, we found that a better representation of the negative Sea Surface Temperature - TC induced feedback, through a high (hourly) coupling frequency, ensures the reduction of the TC induced Power Dissipation Index (PDI) bias of one order of magnitude. In addition, a cat-5 storm case study is deeply investigated also in terms of TC effects on the deep ocean.