

EGU23-1541, updated on 25 Apr 2024

<https://doi.org/10.5194/egusphere-egu23-1541>

EGU General Assembly 2023

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## Rapid Intensification and Rapid Weakening of Tropical Cyclones, as represented by the CMCC-CM3 Climate Model

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Rapid intensification/weakening (RI/RW) refers to a significant increase/decrease in tropical cyclone (TC) intensity over a short period of time. A TC can also undergo multiple RI/RW events during its lifetime, and these events pose a significant challenge for forecasting TC activity. In fact, RW is one major source of large intensity forecasting errors as well as RI. These processes can be associated to particular large-scale conditions, both in terms of atmospheric drivers - such as vertical wind shear or dry air intrusion - and oceanic drivers - such as sea surface temperature (SST) gradient.

In this work we aim to verify the ability of the new CMCC-CM3 model (a preliminary version of the General Circulation Model that will take part to the 7<sup>th</sup> Coupled Model Intercomparison Project - CMIP7 effort) in representing Tropical Cyclone activity with a particular focus on RI and RW. The simulations used in this work have been provided within the EU project BlueAdapt at a 25km horizontal resolution in atmosphere and ocean components, ensuring the representation of realistic TCs both in terms of spatial variability and intensity. Less agreement is found in representing RI/RW timing and duration, but better results are obtained, compared to the previous version of the model CMCC-CM2. The role of the ocean in determining RI and RW is also investigated.