

EGU2020-9591

<https://doi.org/10.5194/egusphere-egu2020-9591>

EGU General Assembly 2020

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Ocean sensitivity to bulk formulae parameterization: a NEMO-ORCA025 model study

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Surface wind stress and heat fluxes (e.g. sensible and latent) are the major driving forces that modify the ocean dynamics and thermodynamics. Therefore, in a modelling framework, realistic momentum and heat fluxes are essential for simulating the global ocean. In the NEMO ocean general circulation model, these air-sea fluxes, which are difficult to be measured directly, are derived using bulk formulas. A large set of bulk formulas exist and this work tries to quantify the ocean response to the different bulk formulations implemented in the newest version of NEMO global ocean model (version 4.0.1). A set of experiments based on the CMCC ORCA025 configuration (1/4° of horizontal resolution) is run and examined. The numerical experiments differ for the bulk formula used to estimate air-sea fluxes (ECMWF, NCAR, COARE and COARE3.5) and they consist of 2-years simulations forced by the recent JRA55-do-v1.3 (□ 55km resolution). Preliminary results on the ocean sensitivity in terms of sea surface temperature, sea surface salinity and ocean currents, also in comparison with available observations, will be shown.

How to cite: Bonino, G., Iovino, D., and Masina, S.: Ocean sensitivity to bulk formulae parameterization: a NEMO-ORCA025 model study, EGU General Assembly 2020, Online, 4–8 May 2020, EGU2020-9591, <https://doi.org/10.5194/egusphere-egu2020-9591>, 2020