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Rapid intensification of a hurricane: an energetic perspective from a 5km ocean-atmosphere ICON simulation

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Hurricane intensity remains the weakest part of hurricane forecasting, contributing to uncertainty in future projections of hurricane climatology. Thus far, there have been a lack of studies into the importance of the ocean, and realistic air-ocean interactions in particular, to hurricane intensification. This study looks at the energy budget of a category 3 hurricane generated within a global run of the ocean-atmosphere ICON General Circulation Model at a resolution of 5km for both components. The development of intensity over the life-cycle of the hurricane is evaluated against the enthalpy fluxes at the surface. Terms within the energy budget equation are analyzed to improve understanding of the physics behind intensification.