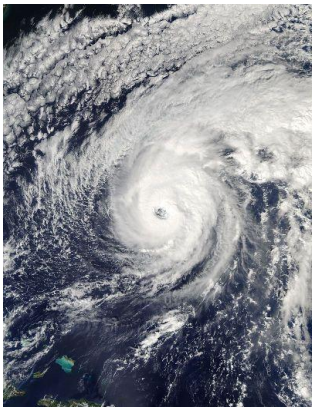
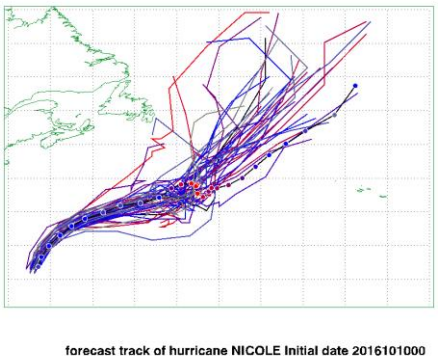
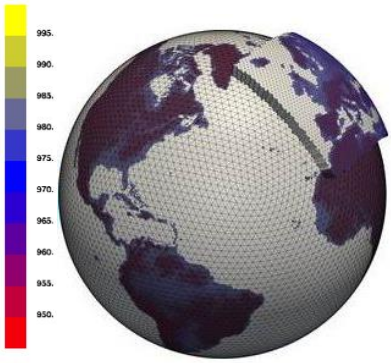
Masterthesis Topic in „Large-scale Dynamics and Predictability“ group IMK-TRO

11 December 2017

“Operational Forecasting of tropical cyclones in the new ICON model at DWD”







sources: nhc.noaa.gov, DWD, DWD

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Description:

Since 2016 the German Weather Service (DWD) runs the global operational forecasting system ICON in both a high-resolution and a pre-operational ensemble configuration. ICON forecasts are freely available and the model is now competitive with other leading forcasting centres. Therefore, high impact weather situations, such as tropical cyclones (TC), become of more and more interest.

In this Master thesis the skill of operational ICON forecasts for the track and intensity of recent tropical cyclones shall be assessed globally. TCs in different ocean basins worldwide will be tracked in the forecasts and compared to analysis or best track data for the last 18 months.

In addition, it is envisaged to explore TC track sensitivity for selected cases with own numerical simulations using ICON. Of particular interest are North Atlantic Hurricanes Harvey and Irma with devastating impacts in the Carribean and USA in 2017. These detailed case studies will elucidate if ICON has model biases, that result in track error, or if the atmospheric conditions were intrinsically unpredictable.

The project will work in close collaboration with colleagues at DWD. The developed diagnostics for TC tracking and TC characteristics could become part of an operational DWD TC monitoring system.

We seek a highly motivated student with interest in tropical cyclones, numerical modelling, and the evaluation of NWP forecasts. Ideally, but not necessarily the student should be familiar in a Linux environment (shell-scripts) and have some basic programming skills (Fortran, ncl, matlab or python).