



The Met Office's new operational analysis system for diurnally varying skin-SST

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Diurnal variations in skin Sea Surface Temperature (skin SST), which can be as large as several degrees, play an important role in determining the heat flux between the ocean and atmosphere. As such, since February 2015 the Met Office, as part of the Copernicus Marine Environment Monitoring Service (CMEMS), has been producing an operational analysis of the diurnal cycle of skin SST. This product consists of three components: an underlying 'foundation' SST (based on the OSTIA analysis), a warm layer where solar heating is important, and a cool skin where cooling due to long wave radiation dominates.

A major development in this system is the use of a 4D-Var data assimilation technique with multiple outer-loops to improve estimates of the warm layer. Observations assimilated come from the SEVIRI, GOES-W, MTSAT2, and NOAA-AVHRR infra-red satellite instruments. Through their assimilation, the observations act to update the applied heat and wind flux such that the diurnal cycle in the warm layer is improved.

In this presentation we describe the analysis system and how it produces a skin SST product. Particular attention is paid to the data assimilation aspects and on the observation processing. We also present results from a three month validation period showing that the system is well able to reproduce a drifter based climatology of the diurnal cycle in SST. A direct validation of our diurnal SST output against near surface Argo data is also given.