

## **An analysis system for diurnal Sea Surface Temperature**

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Diurnal variations in skin Sea Surface Temperature (SST), which can be as large as 6 degrees, play an important role in determining the heat flux between the ocean and atmosphere. At the UK Met Office we are engaged in a program to produce an analysis of the diurnal cycle of SST. This analysis will assimilate satellite measurements of SST into a diurnal model of the instantaneous skin temperature.

We present results from an analysis of the quality and coverage of the diurnal cycle by satellite SST data, both from low orbiting and geostationary satellites. Using data from the SEVIRI instrument we show the particular importance of using data from geostationary satellites in any diurnal study.

While still in the development stage, we present results from the current version of our diurnal SST analysis system. In this system we use a diurnal model based on the ECMWF's warm layer model coupled to the Artale model of the cool skin. To complete the analysis the warm layer is constrained by using a 4DVar method to assimilate available satellite data. To fully control the system the assimilation constrains not only the initial temperature, but also the applied heat and wind forcing. The system has been tested in twin experiments as the model and observation errors are adjusted; results from these tests are presented. We also present preliminary results from the system when it is tested in a global setting with realistic data.