

***Interactive comment on “A statistical model for sea surface diurnal warming driven by numerical weather prediction fluxes and winds” by M. J. Filipiak et al.***

**Anonymous Referee #2**

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General Comments:

This authors developed a simple formulation to calculate sea surface temperature diurnal cycle based on 6-h wind and 24-h accumulated net heat flux from the ECMWF output. Results agree well with those from geostationary satellite (SEVIRI) measurements and the AMSR-E microwave measurements from polar-orbiting satellites. In general, the manuscript was written clearly. The review of previous work was also good.

Specific comments:

Only relatively minor revisions are needed.

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(1) The maximum hourly wind  $W$  is used in Eq. (1) and is critical for the proposed statistical method. It was stated that "The wind are 6-h analyses" on line 22, p. 2508. Are those instantaneous winds at the model time step every 6 hours or are they 6-hour averages? How was the interpolation to hourly values done? by linear interpolation? It seems to be more appropriate to refer to  $W$  as the maximum wind from 6-hourly data.

(2) The interpolation of daily accumulated net heat flux (discussed on p. 1509) would also introduce biases that depend on weather condition, because the authors' method essentially assumes the independence of cloud effects on radiation fluxes of the solar zenith angle. For clear-sky conditions (with strong diurnal cycle of SST), the interpolation may be acceptable. For partially cloudy condition, however, the interpolation method would introduce biases. This point should be acknowledged in the paper.

(3) The easiest way to address the above two concerns would be to use hourly data directly. If it is impossible to do so, at least sensitivity tests should be done and discussed. For instance, results in Figs. 6(a) and 9(a) could be discussed from this perspective.

(4) Because eq. (1) gives the whole diurnal cycle, it is desirable to show a few more results of the actual diurnal cycles of SST (beyond Fig. 7). For instance, the authors could select a few days with strong SST diurnal cycle and plot the actual SEVIRI results and computed results over a few selected areas.

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Interactive comment on Ocean Sci. Discuss., 7, 1497, 2010.

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