

Analytical Investigation of Radiation Flux in the Water Surface Skin With Application to the Remote Sensing of SST

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Abstract

Determination of ocean surface temperature and its temporal variation make researchers able to study the climate in different region, forecast sever storms, track currents and tracing and determining the colony of fishes and many more with a precision that depends on the accuracy in Sea Surface Temperature (SST) determination. On the other hand, SST measurements through vesatile equipments and or bouys in the vast area around the globe if it is not impossible is very expensive. During last few decades, SST measurements are carried out by radiometers onboard of research satellites. In this regard, presence of a cool skin on the surface of water made by evaporation, makes these sensors to show an error of up to 2°C in some regions. This makes the usefulness of these measurements questionable. In this study, the equation of radiation transfer within the skin of the ocean (about 1mm top) is solved and investigated analytically. Results show that the net radiation initiated from a depth of about 20μm. Also the net spectral radiation below and above 12μm has different direction and demonstrate different behaviors.

Keywords: SST, Surface Skin Thickness, Remote Sensing, Spectral Radiation
