Abstract View

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A Multispectral Technique to Determine Sea Surface Temperature Using Nimbus 2 Data

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ABSTRACT

Three channels of the Nimbus 2 five-channel Medium Resolution Infrared Radiometer (MRIR) have been employed in the development of a technique to determine sea surface temperature. Two of the channels in the 0.2-4.0 and 6.4-6.9 μm spectral regions are used to indicate a cloud-free line of slight and the third, a high signal-to-noise window channel (10-11 μm), measures the equivalent blackbody temperature (T_{BB}) which is a function of the thermal emission from the sea surface and the intervening atmosphere. Equivalent blackbody temperatures and normalized reflectance thresholds were established using frequency distributions from the 6.4-6.9 and 0.2-4.0 μm channels, respectively, to determine the existence of cloud-free conditions. The window T_{BB}'s were compared with ship ocean temperature measurements for a one-month period over the western North Atlantic. This comparison revealed a ±1.5K dispersion about the mean difference between the ship temperatures and window T_{BB}'s between 31-34N. An empirical method has been developed to correct for the atmospheric contribution to the observed window T_{BB}'s that considers the measurements from the other two channels and the viewing angle from the radiometer to the ocean surface.

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