

Estimation of Earth Outgoing Longwave Radiation from Satellite Observation

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Abstract

Results from the Earth Radiation Budget Experiment (ERBE) will help interpret the data from the operational satellite system. However, a major problem exists because a follow-on experiment to ERBE is not planned until the late 1990's. Meanwhile, it will be necessary to provide OLR estimates from the operational satellite system. Since 1973 the outgoing longwave radiation(OLR) data have been obtained by the 10 μ m window radiance(AVHRR) estimation technique from the observation NOAA operational satellites. However, those data have not been universally accepted because they are estimated from the radiance in but one narrow spectral region. However, this type of technique has not been exploited for use with data from the HIRS multispectral radiometer. Since the radiance data measured by HIRS contains more information on atmospheric variables than the AVHRR, it is a potentially better instrument for operational estimates of the OLR. In this study, results from model are better flux estimates than the AVHRR. The technique is then tested by comparing simultaneous AVHRR and HIRS OLR estimations with a radiation model flux calculation from homogeneous atmospheric scenes at the regions of desert and subtropic ocean.