

## Use of ATSR data to estimate surface fluxes over land and sea

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### ABSTRACT

This paper aims to assess the worth of satellite data, regional and global surface data in estimating regional and global sea-land-atmosphere heat fluxes. In this paper, the models to obtain the shortwave irradiation, long-wave radiation, latent heat flux and sensible heat flux at Earth's surface from the ATSR thermal band data and the new launched ATSR-2 visible and thermal band data have been developed. In order to achieve these, a technique for the derivation of land surface temperature and land surface emissivity retrieval using ATSR data has been proposed. The visible and near-infrared reflectance were derived from ATSR-2 visible spectral bands by using atmospheric radiative transfer model developed previously.

The models have been applied to the regional ATSR-2 data in UK and global scale ATSR data in areas of open sea. Three physical methods were used to determine solar irradiance by using ATSR-2 data. A new formula has been developed for the calculation of net longwave radiation at the surface. The ATSR-2 data sets have been shown to be useful in helping to study the large space scale heat flux exchange. However, our current analysis is restricted to a small range of conditions and needs to be extended to larger data sets.