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Estimating the Meridional Energy Transports in the Atmosphere and Ocean

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ABSTRACT

The poleward energy transports in the atmosphere–ocean system are estimated for the annual mean and the four seasons based on satellite measurements of the net radiation balance at the top of the atmosphere, atmospheric transports of energy at the north or south poles various types of corrections had to be made, so that the global balances are maintained. This also enabled us to estimate the uncertainties in the procedures used. The uncertainties found are similar to those reported by Hastenrath based on different satellite data sets but using the same correction method.

Finally, oceanic heat transports are computed for the annual mean and seasons. One of the crucial terms in the heat budget, the interseasonal storage of energy in the oceans, is estimated for three different layers 0–112, 0–552 and 0–550 m, enabling a further error estimate in the inferred oceanic heat transports.

The present results confirm the presence of a strong annual cycle in the transport of energy by the oceans.

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