[EJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-CG Complex & General

[A-CG38]Science in the Arctic Region

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The Arctic and circumpolar region is the key area for the study of global change because the anthropogenic impact is projected to be the largest in this area due to the complicated feedback processes of the nature. A number of international and interdisciplinary research projects have been conducted for the studies on the land-atmosphere-ocean system. In order to understand the feedback processes occurring in the Arctic and to project the global warming in the future, we need to establish the intense observational network and to exchange the knowledge and information by combining the different scientific communities under the common interest of the Arctic. The objectives of this session are 1) to exchange our knowledge on the observational facts and integrated modelling and 2) to deepen our understanding on wide range of natural sciences related to the Arctic and the circumpolar region. Studies on humanities, social sciences, and interdisciplinary fields are also welcomed.

[ACG38-P04]A new mass correction scheme for atmospheric enegy transport

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Polar amplification is one of the key climate research questions. In the context of polar amplification and global warming poleward atmospheric energy transport (AET) is of fundamental importance. Yet we are facing difficulties when we estimate changes in poleward AET. Part of the problem is the fact that any atmospheric data, re-analyses or model outputs, are subject to discrete error and uncertainties, which require a mass correction.

Here we present a new mass correction scheme and discuss the results from its applications to monthly re-analysis data of ERA-Interim and JRA55 for the period of 1979 to 2010. We found that there is much discrepancy in the stationary AET between two re-analysis products when conventional calculation is carried out without a mass correction. When we apply a new mass correction scheme, based on the area of lateral vertical wall at given latitude, this discrepancy largely disappears. We further discuss the results from trend analysis on thus corrected data.

In particular we show that at low-latitude there is a decrease in dry static energy component in monthly time-scale, which is nearly cancelled by an increases in latent heat transport. This is in comparison to a decrease in both components at high-latitude.