Geophysical Research Abstracts
Vol. 15, EGU2013-13793, 2013
EGU General Assembly 2013

Results of surface heat balance observations at the drifting stations "North Pole"

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Based on meteorological measurements collected at the Russian drifting stations “North Pole” for the 2007 – 2011 field seasons, estimates have been made of Central Arctic surface heat balances. A number of methods which utilize different parameterizations and measured long-wave and short-wave radiation fluxes are utilized and compared. A description id provided for updated procedures for calculations of turbulent heat fluxes with recent parameterizations of turbulent energy – mass transfer processes. It is shown that the use of the different parameterizations for the stable stratified atmospheric surface layer result in nearly identical turbulent fluxes.

Concurrent numerical experiments with a simple thermodynamic sea ice model reveal a significant underestimation of modeled surface temperatures for the snow/sea-ice skin temperature for cases when there is a very stable stratified atmospheric surface layer.