Tsurane
Kuragano
Japan Meteorological Agency/Meteorological Research Institute
Yosuke Fujii, Japan Meteorological Agency/ Meteorological Research Institute
Takahiro Toyoda, Japan Meteorological Agency/ Meteorological Research Institute
Norihisa Usui, Japan Meteorological Agency/ Meteorological Research Institute
Koji Ogawa, Japan Meteorological Agency/ Meteorological Research Institute
Masafumi Kamachi, Japan Meteorological Agency/ Meteorological Research Institute
Poster
Many previous studies indicated that deviation of global mean seasonal variations between altimetric sea surface height (SSH) and thermal steric height was comparable to the global ocean mass variation, which is caused by total water flux between ocean and atmosphere and by total runoff. While, in a regional aspect, redistribution of the ocean mass caused by barotropic responses to wind stress and surface-pressure variations also plays an important role.
SSH caused by mass variation is simulated using a barotropic global ocean model forced by seasonally varying surface water flux, wind stress and surface pressure. The results indicate that the SSH varies homogeneously in the global ocean by surface water flux, while the SSH variations by wind stress are larger than those by surface water flux in the mid- and high-latitudes. Seasonal fluctuation of the altimetric SSH corrected by the model SSH forced by the above all three forcings is similar to that of steric SSH above a pressure level larger than 300 dbar. The main factor of the seasonal SSH variation is the seasonal cycle of thermal steric variation by heating and cooling of upper-layer oceans. The homogeneous SSH variation by surface water flux and barotropic response to the wind stress are the secondary factors. Baroclinic response to the seasonally varying wind stress has a small effect on the SSH variation because the baroclinic response has a long response time over basin scale and could not follow the seasonally varying wind stress curl.
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