Geophysical Research Abstracts
Vol. 15, EGU2013-12155, 2013
EGU General Assembly 2013

Role of the landfast ice in the Arctic Ocean circulation

Polona Itkin, Rüdiger Gerdes, and Martin Losch
Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany (prozman@awi.de)

Fast ice is not represented in the state-of-the-art sea ice-ocean models and this results in regional overestimation of the sea ice thickness, regional bias in sea ice concentration, underestimation of the amount of the brines formed in the polynyas and unrealistic river water distribution on the shelf and in the Arctic Ocean. In our study we use a simple fast ice parametrization to examine the role of the fast ice for the river water distribution and cold halocline layer formation. Our results show that the fast ice prevents dispersion of the river plume that remains on the shelf in the winter and contributes to a higher export of the river water out of the Arctic. Furthermore, fast ice significantly increases the amount of the dense shelf water that reaches the cold halocline layer. We recommend to include a fast ice parametrization into every modeling experiment aimed to study river runoff distribution and cold halocline formation and stability.