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Evolution of the Arctic Ocean salinity, 2007-2008: Contrast between the Canadian and the Eurasian basins.

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We investigate the variability of the freshwater budget in the Arctic Ocean and in the Nordic and Labrador Seas over recent years, to see how the freshwater balance in the Arctic and the exchanges with the North Atlantic have been affected by the recent important sea ice melting, especially during the 2007 sea ice extent minimum.
An assimilated global coupled ocean/sea ice model with an average resolution of 12 km grid in the Arctic Ocean is used in this regard. Although no sea-ice data and data under sea-ice are assimilated, our simulation over the 2001-2009 period is shown to represent fairly well the 2007 sea ice event and the different components accounting for the freshwater budget, compared to available observations.
We find that, in the model, liquid freshwater is accumulated in the Beaufort Gyre after 2002, in agreement with recent observations, and we show that this accumulation is due to both the sea ice melt and a spatial redistribution of the freshwater content in the Canadian Basin.
In the Eurasian Basin, we find a very contrasted situation. The effect of the sea ice melt is conterbalanced by a salinification of the Atlantic inflow, and a modification of the circulation north of Fram Strait after 2007. The possible link of this change with a change of the atmospheric conditions is discussed.