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The Atlantic Inflow through the Barents Sea from the high-resolution simulations

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Atlantic Water is an important component of the Arctic Ocean circulation. To study Atlantic Water pathways we used the results of a high-resolution global sea ice-ocean simulations for the period 1985 – 2006. The simulations also included passive tracers and ventilation tracer analysis which demonstrated high ventilation of the Barents Sea at few localized sites. Mode waters of Barents Sea Water were identified: the first mode is formed at the shallow convective sites in the northern Barents Sea and contributes in the formation of the Arctic cold halocline water; the second mode is the source of the Arctic low halocline water and is formed in the southeastern Barents Sea; the third dense mode is formed west of Novaya Zemlya. The mode waters continue into the Eurasian Arctic through the northwestern Barents Sea and along the northern Barents Sea shelf, and, via the other route, through the southeastern Barents Sea and the St.Anna Trough. The formation rates of the mode waters along with the heat ans salt transports through the Barents Sea have been estimated and compared to observations.

Keywords
Arctic Ocean, Barents Sea, Atlantic Water, mode waters, ocean modelling