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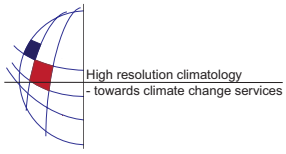

Atlantic Multidecadal oscillation, Thermohaline Catastrophe and their Impact on Climate of the North Atlantic Region

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Problem of regional consequences of natural and anthropogenic climate changes, large-scale interaction in the North Atlantic coupled system and likelihood of thermohaline catastrophe in the recent and past climatic epochs are analyzed using historical/proxy data, assessment of oceanic meridional heat transport and simulation results. It is shown, that fast regional air temperature increasing in the last one third of XX century is due to coincidence of the sign of trend and rise associated with the quasi-periodical Atlantic multidecadal oscillation (AMO). Typical temporal scale of AMO is due to rate of North Atlantic overturning. AMO manifests itself in different climate characteristics of North Atlantic, European and North American regions. In particular, the absence of the surface temperature trend in the region of interest (and over the globe) during the last ten years is due to mutual compensation of the global warming and AMO-related variations. Principal mechanism of AMO impact on climate anomalies in the surrounding (to the North Atlantic) regions is due to atmosphere response to temperature anomalies in the ocean. Large inertia of the coupled ocean-atmosphere system provides decadal predictability of AMO and associated frequency of different meteorological events. Thermohaline catastrophe is unlikely under present climate conditions and in general in the recent climate epoch (in opposite to the past climate).