PROBABILISTIC ANALYSIS OF HEAT FLUX DISTRIBUTION IN OCEAN

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The study of heat interaction processes and the distribution of heat flaxes in the oceans is important for understanding climate change on Earth. The North Atlantic, which is one of the key components of the global climate system, plays a significant role in regulating the climate of our latitudes. One of the key tools for analyzing heat distribution in the oceans is probabilistic analysis. In this work, using mathematical modeling methods, a statistical analysis of observational data on heat fluxes in the North Atlantic is carried out.

The used methods include the analysis of random processes specified by the stochastic differential equation (SDE) or the Ito equation, approximation of observational data, and solution of the Fokker-Planck-Kolmogorov (FPK) equation to describe the evolution of the probabilistic distribution of heat in the ocean. Using mathematical modeling methods, a probabilistic analysis of the distribution of heat fluxes in the North Atlantic for the period from 1979 to 2022 has been carried out. The results of the study made it possible to establish patterns of distribution of heat flux in the studied region over the period of time under consideration. The results may be useful for further study of climate processes in the North Atlantic, as well as for the development of resource management and environmental protection strategies.