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Atmospheric low-level inversions in the Central Arctic Basin

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Frequent repetition of temperature inversions is one of the features of lower atmosphere in the polar regions. Its investigations are important for better understanding the processes that cause climate change in high latitudes due to impact on the heat balance in the atmospheric boundary layer - underlying surface system, the growing role of anthropogenic factors, and also as one of the possible mechanisms of polar amplification. Data on the vertical profiles of air temperature were obtained during year around operation at the drifting station "North Pole - 41" with the microwave temperature profiler MTP-5RE. The main characteristics of the inversion layer: heights of the lower and upper boundaries of inversion Zb, Zt with corresponding temperatures Tb and Tt were calculated with MTR-5PE software product.

Based on each 5 minutes observations of temperature profile in the lower kilometer of the atmosphere, carried out at the drifting station "North Pole - 41" in 2022 - 2023, seasonal variability of low-level inversions characteristics, formed in the Central Arctic Basin, is described. Statistical estimates of the characteristics are given and their significant difference in the winter and summer seasons due to peculiarities of radiation regime, cloudiness and the state of the ice cover are shown. An increase in the frequency of elevated inversions with a significant decrease of its depth and power in the winter 2022 - 2023 compared to the same period of 1981 - 1987 are revealed.

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