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Past, recent State of the Circulation of Atmosphere and Weather on the Territory of Atlantic-European Sector

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The analysis of climate change is carried out usually by study separately changes over long time of air temperature and precipitation in points. This analysis can be objective in time and space, if interrelation of the fields of air temperature and precipitation would be considered taking in account the circulation of atmosphere. In this work climate change was researched over change of the large-scale circulation of atmosphere on the Northern Hemisphere and particularly on the territory of Atlantic-European sector with Ukraine territory. The current state (over past 20 years) of the pressure fields and centers action is analyzed.

Comparison of the pressure fields averaged on 10 and 30 years within past 120 years showed significant recent changes. It was shown that seasonal centers of action of atmosphere changed the geographical position. These changes cause the warm winters and cool summers in the Ukraine. The air temperature on the most part of the Ukraine is at 2^0C higher than in the middle of XX century. Especially cool summer is on the south of the Crimean peninsula. It was shown that character of regional circulation would be governed by two kinds of circulation that are responsible for new regional climate. The predominantly circulation is high pressure ridge that will determine sharp changes of temperature and aridity in all seasons. However, another regional atmospheric circulation is marked also often during last years and forms the strong precipitation. The second circulation is created in consequence of the appearance of “bands of heat” of big stretch from earthly surface. These “bands of heat” are stable in time (2-3 weeks). The created narrow depression above “band of heat” is the trap for moving cyclones. Such bands of heat block west-east atmospheric movement and create new modern atmospheric circulation that brings all kinds of dangerous me-

teorological events in different regions of Atlantic-European sector.

To analyze change of contemporary temperature and humidity regime in the Atlantic-European sector caused by circulation the theory of pattern recognition and method of Markov chains were used. Analysis of 100 year series allowed estimate future state of the climate of the Ukraine and regional circulation. In this work analysis of the changes of temperature and the pressure fields showed that anthropogenic impact is different for different areas in the Atlantic-European sector. For example, the anthropogenic component of temperature increase over 1^0C was observed on the central regions of the Eastern Europe and Norwegian coast. The anthropogenic component of temperature decrease was observed over North Atlantic coast.

This study showed that current circulation of atmosphere in all seasons acquire new state of the atmospheric circulation on the territory of Atlantic-European sector that brings all kinds of dangerous meteorological events in different regions.