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Geographically-high-altitude dependence of thunderstorm activity for Almaty region

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The results of Geographically-high-altitude dependence of thunderstorm activity for Almaty region research are given in the article. One of the of the important analysis elements was the estimation of the number of days correlation dependence with thunderstorms on the altitude. For this purpose, the dependence of the annual average number of days with thunderstorms from the altitude of the place was determined for each type (subtype) of macro - and mesorelief based on regression analysis, and also the statistical significance of the correlation coefficients by the t-test and Fisher test with reliable probability p = 0,90- 0. 95. was assessed. On the basis of the results mapping of storm activity was carried out using equations of regression and digital elevation models. The areas with the most active thunderstorm activity were identified. Also it was identified, that local areas with higher storm activity were observed in mountain and foothill areas of Ile and Jungar Alatau at a height of 1.5-2 km.

Key words: thunderstorm, the number of days with thunderstorms, terrain elevation, digital elevation model (DEM).

INTRODUCTION

Altitudinal climatic zonation is the main feature of the mountain and foothill areas. But in some cases, altitude dependence of some meteorological variables and phenomena is strongly distorted and camouflaged with meso and micro relief terrain conditions. For this reason, in order to identify such dependences it is necessary to use special techniques that allow taking into account the effect of different scales orographic. In present study we deal with the climatic characteristics of thunderstorm activity for the complex territory with regard to orographic - Almaty region of Kazakhstan. Orographic location of the region studied is distinguished by its diversity. The northern part of low inclined to the north plain of Pibalqash (height 300-500 m), with arrays of ridgy and quick sands (Sarah-Ishikotrau, Taukum). In the south and east the ridges with two arrays extend up to 5000 m: Ile Alatau and Jungar Alatau Mountains (Tian Shan).

At the joint of gradually dipping slopes Ile`s average river bed is located. Leading air currents in this area meet the natural barrier in the form of mountain uplifts (Jungar Alatau on the east, Ile Alatau on the south) that create the most favorable conditions for the aggravation of atmospheric fronts, strengthening of forced and thermal convection and the development of thunderstorms.