



LNS as a new tool for severe weather detection in relation to climatic studies

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The Lightning Network System (LNS) in Ukraine was installed in 2016. It consists of 12 sensors located in different parts of Ukraine, which allow identifying both types of lightning: "cloud-ground (CG)" and "inter-cloud (IC)" for the entire territory of Ukraine and allows the determination of the CG with a probability of 95 %, and the spatial accuracy of lightning detection is about 200 meters.

To analyze the spatial and temporal distribution of lightning activity over the territory of Ukraine, data from LNS within June-September of 2016 period were used. The main idea of the analysis was to compare the average monthly data on lightning activity over the territory of Ukraine in the warm period of the year (June-September), obtained using the new technology (LNS) with the corresponding data at weather stations.

The main climatological features of the spatial and temporal distribution of lightning activity over the territory of Ukraine were based on station observations. It was noted that the areas with the highest number of days with lightning activity are the Ukrainian Carpathians, Volyn, Podolsk, Dnieper and Donetsk highlands, and the smallest number was observed in the Crimea. Our analysis showed that in June, the maximum number of days with lightning was observed in the Kiev region (13), and the minimum - 1 day on the southern coast of the Crimea, which corresponded to the Average Long-Term Values (ALTV). In July, the maximum number of days was noted in the Ukrainian Carpathians (15), which is also quite close to the ALTV - 12 days. In August, there was an increase in the number of days in the south and east of Ukraine (in the Crimea up to 18), and the minimum number of days (3) was in the north-west, which not corresponded to the ALTV. In September, 1-2 days were observed with lightning activity over the all territory of Ukraine, which corresponded to the ALTV. The greatest inconsistency between the ALTV and LNS data was for the ratio of the lightning number to the number of days with lightning activity. ALTV are in the range of 1.00 - 1.15 and LNS data – from 1 to 500. Of course, such a large difference is determined by the great technological capabilities of instrumental observations, unlike the observer's subjective assessment. Thus, the obtained LNS information could be a new, high-quality data source for climatological studies.