DOI: https://doi.org/10.37162/2618-9631-2022-3-42-77

Verification of radar precipitation nowcasting of significant areas using the generalized Pareto distribution. Part 2: Application to forecasts in warm and cold periods of 2017–2018 / Muravev A.V., Bundel A.Yu., Kiktev D.B., Smirnov A.V. // Hydrometeorological Research and Forecasting, 2022, no. 3 (385), pp. 42-77.

The generalized Pareto distribution was used to model the distribution of precipitation area sizes that were observed and predicted for the coverage zones of individual radars by the Hydrometeorological Research Center of the Russian Federation's nowcasting scheme in 2017-2018. Various methods for estimating the distribution parameters and confidence intervals were tested. The main attention was paid to the estimates of the shape parameter that determines the behavior of the distribution tail. The generalized assessment of the nowcasting quality is built on the intersection ratio of the corresponding confidence intervals. It is shown that for most cases the Pareto threshold of 625 points, which is equivalent to a square of 50×50 km, separates objects of larger sizes that are satisfactorily modeled by the heavy-tailed distribution and which are quite acceptably (on "climatological" average) predicted by the precipitation nowcasting system for specific periods of the year.

Keywords: precipitation nowcasting, spatial verification, radar precipitation estimates, statistical analysis of threshold exceedances, mathematical packages for extreme value analysis

Tab. 10. Fig. 8. Ref. 16.