The Model of Hydrodynamic-Statistical Short-Term Forecast of Heavy and Dangerous Precipitation in Indian Monsoon

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At this report the results of study of meteorological situations, which involve heavy and dangerous rainfalls at the territory of India are presented. The model of short-term forecast of these phenomena in Indian monsoon was developed in the framework of the international collaboration between Hydrometeorological Center of Russia and Indian Department of Meteorology. There is presented the model of the short-term (up to 12-24-36 hours) automatic method of forecast of dangerous half-days precipitation at the period of the summer of 2004-2005 and 2008-2009 years in Central and North India. The method is based on the statistical interpretation of the hydrodynamic forecasts output of the hemispheric model (2004-2005 years) and on the statistical interpretation of the hydrodynamic forecasts output of the global model of Russia (2008-2009 years). The statistical decisive rules for diagnosis and prognosis of heavy (Q>14mm/12h) and dangerous (Q>49mm/12h) precipitation for the warm season were calculated separately using the data samples of objective analysis in accordance with the data on precipitation in the Central and North India in the monsoon period. The problem of choose of informative vector-predictor is decided by method of diagonalization of correlation matrix and choosing of factors from blocks of connection predictors [1]. The probabilities of two grades of precipitation, connected with two discriminant functions, are calculated in the nodes of the grid of 150x150km, covering the territory of Central and North India. For the categorical forecast it is recommended to calculate the forecast area, bounded the isoline of threshold probability **P**=98% for the heavy rainfalls und to calculate the forecast area, bounded the threshold probability **P**= 65% for other discriminant function for the dangerous rainfalls forecast. The estimations of this forecast are successful enough (criterion of Pirsy – Obukhov T=0,51-0,62) [2,3].
The quantity forecast of dangerous precipitation in the points on forecast area with Q>49mm/12h was calculated by our new regression function F(X).
The examples of the forecast of heavy and dangerous precipitation are presented at this report. There are also at this paper the results of Russian forecast model and the results of Indian meteorologists forecast for the territory of the cost Karnataka are compared.

References

[1] E.V. Perekhodtseva. *The Proceedings of HMC of USSR*. Issue 271, 37-60 (1985)
[2] E.Perekhodtseva, Murty Krishna. *Abstracts.* 20th Assambley of EGS (Nice, 2001)
[3] E. V.Perekhodtseva, L.V. Zolin. *The Proceedings of Hydrometcenter of Russia*. Issue 338, 79-83 (2003)