a new predictability index of heavy rainfall in China

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To meet the requirement of developing the new method for evaluating forecast skill of heavy rainfall, the main factors effecting forecasters' confidence of heavy rainstorm's forecasting, that is, the forecasting ability of the statistics characteristics of the heavy rainstorm climate , the characteristics of movement scale of the effecting system and the numerical model. This paper designed a new mathematical model of Synthetic Predictability Index of Heavy Rain(SPI) which is composed of three components: rainstorm climate frequency, rainstorm area ratio and numerical model rainstorm forecasting success index (Threat Score, TS) via the use of 5km * 5km resolution muti-source precipitation fusion grid analysis data, site precipitation observation data and precipitation forecasting data of national region operational model and statistics method of extended space rainstorm sample of the National Meteorological Information Center from April to October in 2008 to 2016, to analysis the temporal and spatial variation and distribution characteristics of SPI. The results show that the regional precipitation of the regional heavy rainfall can be changed along seasons and its spatial distribution, but not uniformly: April to May, the more predictable areas are mainly distributed in southern China. From June to July, the main distribution in middle-July to August, large values center moved from northern part of Jianghuai to north and northeast regions. In September, the subtropical high pressure was withdrawn and large value center was moved south correspondingly. In addition, the partial correlation coefficient between rainstorm predictability index and three components shows that the partial correlation coefficient between the RA and the storm area ratio is the highest, and the partial correlation coefficient is higher than 0.9. The comprehensive index of rainstorm predictability in China has laid a footstone for the development of predictability based predictive rating of rainstorm forecasting.

Key words Heavy rainfall over china, Climate frequency, Area ratio, Threat Score of heavy rainfall of numerical model, Synthetic Predictability Index of Heavy Rainfall