Categorized correction forecast for accumulative precipitation of heavy rainfall processes based on optimal probability (OPPF) in medium-extended-range forecast time

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By taking the ensemble prediction data from ECMWF and the intensive observations of precipitation in China, the technology of categorized correction forecast for accumulative precipitation of heavy rainfall processes based on optimal probability(OPPF) is developed, and 3 calculation schemes of OPPF are designed according to overall technical route. Then the reforecast test are carried for the accumulative precipitation of 67 heavy rainfall processes from May to September during 1981 to 2015 in China, and the forecast performance of the 3 OPPFs against that of ensemble mean (EMPF) and control number (CTPF) is evaluated and contrasted. The results show that:(1) In the medium-extended-range (096-360h) forecast time, the performance of the 3 OPPFs are better than that of EMPF and CTPF for heavy precipitation forecast and clear-rain forecast. the performance of OPPF1 and OPPF2 is close to that of EMPF for Moderate precipitation and larger precipitation. OPPF3 produces the best performance among the 3 OPPFs. (2) There are obvious regional differences in forecast performances. TS of OPPF3 in southern China are higher than in northern China, and the performance of OPPF3 for heavy precipitation is better than that of EMPF in southern China. During 096-240h forecast time, the performance of OPPF3 for heavy precipitation is also better than that of EMPF in eastern part of Northeast China.

Keywords: optimal probability, accumulative precipitation of heavy precipitation processes, categorized correction forecast, comparative evaluation of forecast performance

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