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Runoff Interpolation and Budyko Framework over 300 Catchments across China

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The Budyko hypothesis illustrates that mean annual evapotranspiration is largely determined by precipitation and potential evapotranspiration, which can be adopted to estimate mean annual actual evapotranspiration. In this study Fu's equation derived from the Budyko hypothesis is firstly tested by using mean annual streamflow and meteorological data of over 300 hydrological stations from ten main basins in China. Result shows that significant differences yield in the application of Fu's equation among basins. Secondly, the relationship between the single parameterωin Fu's equation and climatic and human factors was built to reveal the time variation of it. Meanwhile, the spacial structure characteristic of the regionalized variable ω was analyzed including spatial autocorrelation and locality. Then a stochastic interpolation scheme based on geostatistical interpolation, adding a constraint of global water balance in river system, is developed to mapping ω and runoff, aimed to predict runoff of elements of target partition of main basins and compare to the results computed by using Budyko hypothesis.