



The application of quantile regression in autumn precipitation forecasting over Southeastern China

Baoqiang Wu and Huiling Yuan

Key Laboratory of Mesoscale Severe Weather/Ministry of Education and School of Atmospheric Sciences, Nanjing University, Nanjing, China

This study applies the quantile regression method to seasonal forecasts of autumn precipitation over Southeastern China. The dataset includes daily precipitation of 195 gauge stations over Southeastern China, and monthly means of circulation indices, global Sea Surface Temperature (SST), and 500hPa geopotential height. First, using the data from 1961 to 2000 for training, the predictors are chosen by stepwise regression and the prognostic equations of autumn total precipitation are created for each station using the traditional linear regression method. Similarly, the 0.5 quantile regression (median regression) is used to generate the prognostic equations for individual stations. Afterwards, using the data from 2001 to 2007 for validation, the autumn precipitation is forecasted using quantile regression and traditional linear regression respectively. Compared to traditional linear regression, the median regression has better forecast skills in terms of anomaly correlation coefficients, especially in the regions of north Guangxi Province and west Hunan Province. Furthermore, for each station, quantile regression can also estimate a confidence interval of autumn total precipitation using multiple quantiles, providing the range of uncertainties for predicting extreme seasonal precipitation.

Keywords: quantile regression, precipitation, linear regression, seasonal forecasts