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Spatial effects on extreme precipitation in the coastal areas of southeast China

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Extreme precipitation event, along with its secondary disasters, is one of the largest natural hazards leading to massive loss in human society. In the coastal areas of southeast china, tropical cyclones (TC) frequently visit the region with intensive precipitation in summer and autumn. Besides TC induced extreme precipitation, convectional precipitation is an alternative reason of extreme precipitation. This study investigated the spatial effects of the extreme precipitation during the raining season for both TC induced and non-TC induced extreme precipitation. The seasonal maximum daily precipitation data through 94 stations in southeast coastal areas of China from 1964 to 2013 were used. We developed a hierarchical Bayesian model with generalized extreme value distribution (GEV) to quantitatively assess the effects of spatial factors on the extreme precipitation. TC induced and non-TC induced extreme precipitation are modelled separately. It was found that the spatial factors that affect the TC induced and non-TC induced extreme precipitation are clearly different. For the TC induced extreme precipitation, the distance to the coastline has been found to be a significant spatial covariate that affects both the location and scale parameter of GEV across the whole areas, while spatial factors are diverse in different locations for non-TC induced extreme precipitation.