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Direct effect of potential extratropical transitioning tropical cyclones on rainfall over the China mainland

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The direct effects of extratropical transitioning tropical cyclones (ETCs) on rainfall over the mainland of China for 1998-2013 are investigated. Only the rainfalls produced by ETCs before their transitioning and within 500km from their centers are considered, so they are called as the direct rainfalls of potential ETCs in this paper. The results show that there are about 54.2% TCs in the Western North Pacific may produce direct rainfalls over the China Mainland during the 15 years, wherein 66 (/199) undergo ET. The TC rainfalls northern to 42°N are mainly produced by the potential ETCs. These ETCs mainly formed over the sea east to the Philippines in August and September. Their direct rainfalls are mainly located at the regions eastern to the Mongolian Plateau, the Loess Plateau and the Yunnan-Guizhou Plateau. Their rainfalls begin affecting China since May, reach the northernmost part in August and retreat south in September. During the initial day when potential ETCs affecting the China, their centers are mainly located over the sea southern to 30°N and western to 115°E, and the maximum TC density is located at the region southern and eastern to Taiwan. When the rainfalls begin affecting China, most of them possess the intensity stronger than TY. The maximum average rainfall area and intensity of each TC possess the intensity weaker than TD. All the results in this paper will facilitate the better understanding about the climatic characteristics of the direct rainfalls of TCs over the mainland of China. (This research was supported by the National Natural Science Foundation of China under Grant Nos. 41375049, 40905021 and 41275099, the Chinese Postdoctoral Science Foundation No. 2011M500894 [U+FF09]
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