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Title: Low-latitudes rainfall characteristics and its meteorological factors an with mesoscale statistics of TRMM PR data

Abstract:

Rainfall has great impacts on climate. Not only its amount, but also it characteristics such as intensity, duration, frequency, and diurnal vari are important for evaluating actual impacts on the earth's surface (c Trenberth et al. 2003). Moreover, as we know by experience, characte of rain are intimately related to the meteorological phenomena that c the rainfall. The first space-born precipitation radar on the Tropical Ra Measuring Mission satellite (TRMM PR) has been provided us with the dimensional rainfall profile data over land as well as over ocean, whic enabled us more precise statistics of rainfall characteristics than befor There have been extensive efforts to describe the global variability of characteristics (cf. Dai 2001a,b), including the TRMM PR analyses (Sh Nakamura 2000, Takayabu 2002, Hirose and Nakamura 2002). Howev there have been no attempts yet to classify the meteorological factors global rainfall dynamically, utilizing the statistics of satellite-observed precipitation data. Utilizing TRMM PR data, here we first investigate th tropical and subtropical rainfall characteristics from the mesoscale-bo statistics. Secondly, we attempt the classification of dominant meteor factors from the analyzed rainfall characteristics for each 2.5deg x 2.5 longitude-latitude grid and for each three months. Then finally, we qu the rainfall characteristics and amounts associated with each meteoro factor. Mesoscale boxes were cut out from the PR2A25 version 5 path The box size is comparable with 1degree x 1degree latitude-longitude statistical characteristics of rain in each box were obtained. The analy period is from June 1998 to May 2001, and the analysis region is 35N all longitudes. For each box, we calculated five parameters to charact the rainfall properties, which are stratiform pixel ratio (SPR), stratifor ratio (SRR), precipitation area (Ares), averaged rain top height (RTH) rain intensity (RI). From statistics of box parameters, it was shown th statistics of above five parameters together with diurnal variation of g can reasonably represent the meteorological factors. Then based on t statistical results, we determined the seven dominant meteorological for rainfall for 2.5 degree longitude-latitude grids for three months. Fo types of rain are classified over land; TYPE I is afternoon shower, TYP continental shallow rain, TYPE 3 is continental frontal rain of extra-tro storms, and TYPE 4 is continental organized systems. Other three typ over ocean; TYPE 5 is oceanic shallow rain, TYPE 6 is oceanic frontal r