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Depth-Duration Characteristics of Global Tropical Rainfall

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In this study, we analyse daily rainfall observations (at 1°, obtained by regridding the 3-hourly, 0.25° TRMM 3B42 data) to compare and contrast the depth-duration characteristics of global tropical rainfall. Defining a wet spell (dry spell) as the number of consecutive days of rain above (below) a prescribed threshold, we find that the probability distributions of wet spell duration appear to exhibit universality in the following sense: While both ocean and land regions which receive "high" rainfall show a predominance of 2-4 day wet spells, those regions which receive "less" rainfall are dominated by 1-day wet spells. Interestingly, the behaviour that we observe for the wet spell duration is reversed in the dry spell characteristics. In other words, the main contribution to the dry part of the season appears to come from 3-4 day dry spells in the non-rainy regions, as opposed to 1-day dry spells in the rainy regions. The total rainfall accumulated in each wet spell has also been analysed, and we find that the major contribution to seasonal rainfall for non-rainy regions comes from 1-4 day wet spells; however, for rainy regions, this contribution comes from 2-10 day wet spells.