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Clouds and the incidence of precipitation from CloudSat

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A method is described to evaluate the incidence and intensity of precipitation viewed from CloudSat by taking advantage of the known attenuation characteristics of the radar. Global analyses of clouds and their associated precipitation from the first sixth months of CloudSat operation are presented. It is shown that the tropics (30N-30S) predominantly favors clouds with tops in two layers centered at about 2 and 12 km. Precipitating clouds occur primarily in three modes, a shallow mode that is the most frequent type, as well as a middle and deep mode. The occurrence of a low-level congestus mode of cloudiness and precipitation is shown to vary regionally, being most evident in regions of deep convection in the western Pacific . For all regions examined, precipitating clouds are observed to be deeper than non-precipitating clouds. Over the global tropics, 16% of the clouds detected by CloudSat produce precipitation.