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Interactive comment on "Distributions and radiative forcings of various cloud types based on active and passive satellite datasets – Part 1: Geographical distributions and overlap of cloud types" *by* J. Li et al.

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In this paper the authors use a CloudSat-CALIPSO based dataset of cloud types to perform four different tasks: show the global distribution of those cloud types, show the day-night differences in their occurrence, compare the cloud types to similar ones derived from passive satellite retrievals and surface observations, and derive some conclusions on the validity of overlap assumptions used in global models. The analysis performed in those tasks involves mostly plotting existing datasets and includes little or no original analysis methods, and the results are for the most part well known from previous studies. The paper is at the level of a technical report and does not provide

any new scientific insights. Therefore, it does not merit publication in a scientific journal. A review of the four tasks is detailed below.

In the first task, the authors download the existing CloudSat 2B-CLDCLASS-Lidar dataset and plot 2-D maps and zonal mean plots of the cloud-types included in that dataset. The analysis step is trivial and the resulting cloud-type distributions are well known from previous analyses of both passive and active satellite retrievals. In the second task the authors plot the day-night differences between the cloud types. However, the particular dataset is not a good tool to look at diurnal variations because, as they even acknowledge, the differences come simply from the two overpass times of the satellites. In the third task, the authors compare the cloud-type frequencies with those of other satellite and surface datasets. The comparisons reveal the well known biases of the different observing systems that have been explored in previous studies. Finally, the authors analyze the overlap properties of the different cloud type combinations and test the validity of model overlap assumptions. This is the only interesting part of the analysis and can be explored further by the authors in future work related to model overlap improvements. However, they have to take into account that the cloud-type definitions of the particular dataset include a number of classification rules and assumptions that need to be taken into account if the method is to be applied to test model output.

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