

Second Review of “Albedo susceptibility of Northeastern Pacific stratocumulus: the role of covarying meteorological conditions” by J. Zhang et al.

Atmospheric Chemistry and Physics

December 1, 2021

The authors have addressed most of my comments from the first submission. However, I believe that the uncertainty analysis is still not entirely correct. For this reason, I recommend *minor revision* for the current manuscript, and I recommend that the manuscript be accepted for publication when this issue is addressed. Please see my comments on the uncertainty analysis below.

Comments on Uncertainty Analysis

If I understand the methods section correctly, the authors calculate spatial autocorrelation between CERES footprints *within* each $1^\circ \times 1^\circ$ lat-lon gridbox (line 196). If this is true, then the uncertainty quantification is not entirely correct because autocorrelation needs to be calculated for the variables that are used in the regressions (i.e. the $1^\circ \times 1^\circ$ gridbox-mean values, not the footprint values within gridboxes). The correct way to calculate spatial degrees of freedom is to first calculate gridbox-mean values of A_c . This will result in a three-dimensional array of A_c values with dimensions of lon, lat, and time. Then remove the climatological seasonal cycle from each lat-lon gridpoint and apply equation 5 of Bretherton et al. 1999 to the array to get the effective spatial degrees of freedom. I do not expect this to change the interpretation of the data that the authors have nicely presented, but I do think it is important that the uncertainty quantification is done properly so that the results can be compared to other studies.