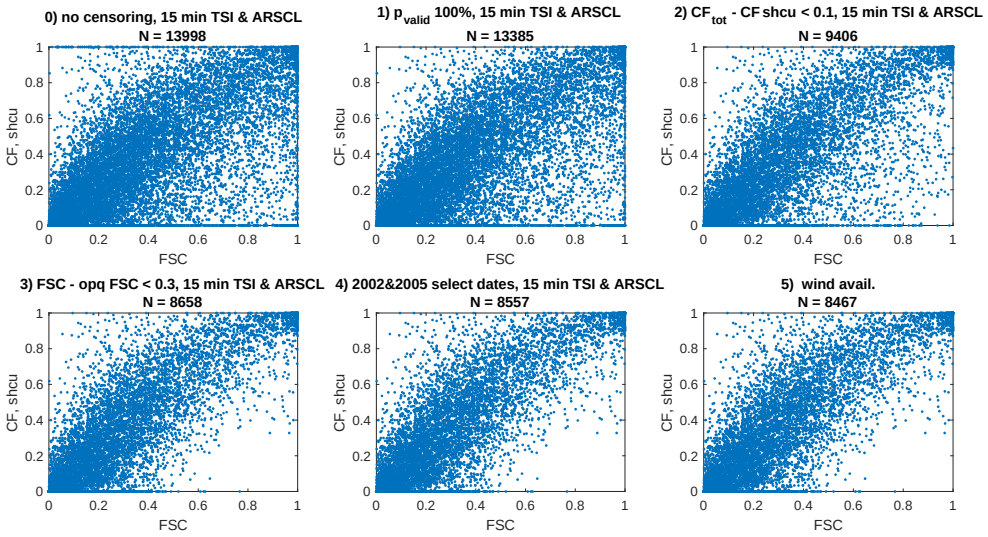
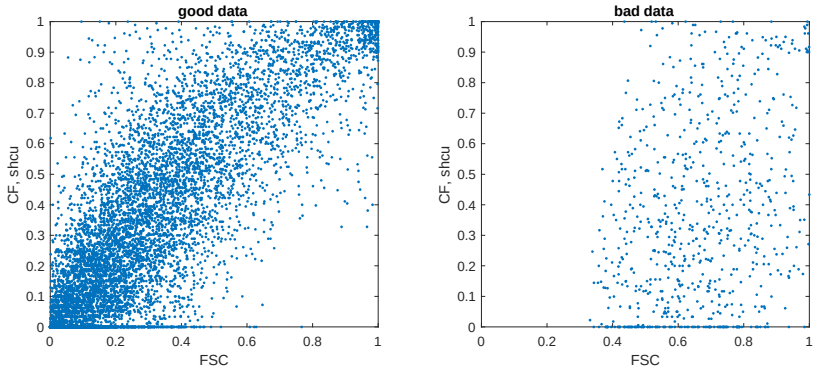


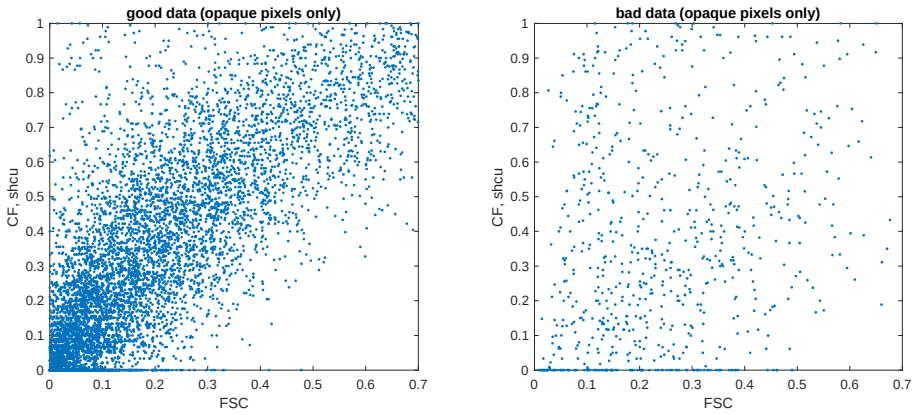
Of the ~13,998 time periods (15-minutes long) originally identified we censor times based on a few criteria.

1) All radar/lidar measurements must be valid in the 30-minutes. This reduces the data to 13,385
2) The shallow cumulus cloud fraction from radar/lidar must be within 0.1 of the total cloud fraction. The presence of other cloud layers further reduces the data to 9406.
3) The thin cloud amount must be less than 0.3. This further reduced the data to 8658
4) Removing selected terrible periods from 2002 an 2005 reduces data further to 8557.
5) Finally the lack of information on wind speed and direction leads to another reduction to a final 8467.

From step 3, we can see ~10% data is lost due to a preponderance of thin clouds. The thin cloud amount error significantly contributes to the disagreement between cloud fraction and fractional sky cover.



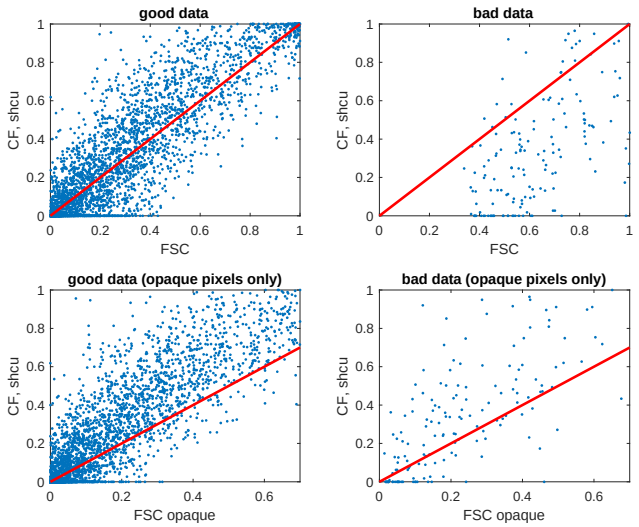
Here we compare the FSC and CF for “good data” with requirement that thin clouds be < 0.3 and the bad data with thin cloud >= 0.3.



Here we compare the TSI FSC (For OPAQUE pixels) and CF for “good data” with requirement that thin clouds be < 0.3 and the bad data with thin cloud >= 0.3. Values above 0.7 are excluded in the left figure because the maximum amount of FSC for opaque in the bad data is 0.7 by definition. The elimination of the thin pixels in the bad data does not improve agreement with CF.

Update regarding 2012-2017

The data were subset without regard to wind availability.
Here are the scatter plots pertaining to this smaller time period



After declaring the 15-minute time intervals as belonging to “good” or “bad”, the individual images belonging to these time periods were collected. The good data consists of 102,005 images, and the bad images are only 4,744.

Below I show the correspondence between the 15-minute CF centered on each image versus the 100-degree FOV FSC for each image for this 2012-2017 time period. The pink line is the 1:1 line. If the neural network improves the TSI retrievals, then we would expect the bad data to be improved on the 1:1: