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Interactive comment on "Replacing Missing Values in the Standard MISR Radiometric Camera-by-Camera Cloud Mask (RCCM) Data Product" *by* Michel M. Verstraete et al.

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Dear Catherine,

Thanks a lot for your comment. Here are some further thoughts on these questions:

1. In our investigation, we found that ALMOST ALL MISR RCCM data sets (from any Path, Orbit and Block) contain some missing values. The numbers remain rather small, compared to the total number of observations actually available, but are not null. As an example, here is a plot of the time series of the number of missing RCCM values for Path 190 and Block 062 (an area covering the central Mediterranean sea,

between Tunisia and Italy, far from any Local Mode acquisition sites), from the start of the mission to early 2019. It can be seen that most data sets feature between 300 and 400 missing values (i.e., per Block) throughout the entire period.

2. As you correctly point out, the fill values 255B may only be used outside of the Block range for which there are actually usable data (e.g., in polar regions during the local winter), while a null code indicates an unobserved or a missing value within that Block range. For practical reasons, the software code that generates the maps shown in the paper represent both codes in red, so that it can work everywhere. This has no impact on the processing, which only attempts to replace null codes.

3. Regarding the effect of sun glint, the statement "it does not enter into the RCCM calculations so the affected areas will almost always be classified as Cloudy even if they are Clear." is incorrect: The RCCM thresholds are binned by sun-view geometry, and they have been tuned to deal with sun glint in those sun-view geometry bins (Zhao and Di Girolamo, 2004). That said, errors may still occur and may lean towards calling clear strong glint regions over water as cloudy, though not "almost always": this process concerns only about 15% for the glint regions of the AN camera (Zhao and Di Girolamo, 2006). Publications assessing this issue for the other cameras don't exist, but one of us (LDG), having looked at RCCM fields for almost 20 years, estimates this effect to be about the same in affected non-nadir cameras: around 15%.

Nevertheless, the proposed updating of the RCCM data product amounts to an interpolation scheme where we rely on existing and confirmed cloudiness estimates in some cameras and bands to infer the cloudiness levels in other cameras and bands. There may be a marginal bias towards increased cloudiness over water bodies, but this would be mitigated by the fact that the algorithm considers two neighboring cameras. Lastly, this possible side effect would of course not occur over continental regions.

Thanks again for stimulating this discussion.

References

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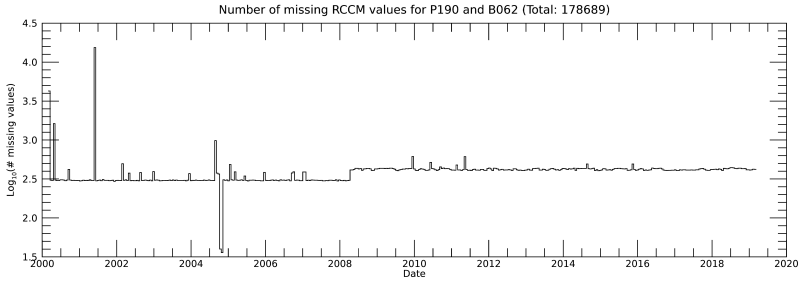

Fig. 1.