Interactive comment on "Hyperspectral ultraviolet to shortwave infrared characteristics of marine-harvested, washed ashore and virgin plastics" *by* Shungudzemwoyo P. Garaba and Heidi M. Dierssen

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General Comments

The submitted data description paper contains important baseline measurements of both macro- and microplastics, the latter in both weathered, dry and wet, as well as virgin form. This is an important dataset for the field of remote sensing of marine plastics and the authors are highly applauded for making such a dataset public. We all thank you for making this available to everyone. I still have some comments as to how

this data should be presented, especially with respect to questions that remain open as to what these data represent.

Specific Comments

Light has different penetration depths dependent on wavelength. This has been somewhat accounted for in the analysis in that wet microplastics were also measured, but a direct discussion of this fact is missing from the entire manuscript (I made note of this being missing at lines 20/21 in the Abstract and at the end of Section 3.2). This point should be addressed in more depth in the manuscript.

It would also help to make the above-mentioned point if in Fig. 4 the 30 ppt saltwater absorption curve over the same wavelengths range would be shown. Furthermore, the maximum penetration depth of light at each particular wavelength could be presented. This would aid in better representing the limitations of the dataset.

There is no discussion of what different plastic types are represented in the microplastic samples and in what proportions. I noted this first at line 10 in Section 2.1, where the samples are being separated by size (which never comes up again in the following analyses, so that step is somewhat moot? Consider removing it). This is especially frustrating since you thereafter present the spectral curves for different virgin plastic types. The discussion of microplastic spectral curves (first paragraph Section 3.1) focuses only on different colors of the plastic measured, despite the fact that different polymer types play a very important role for spectral curve shape in the NIR-SWIR range. The plastic types of the macroplastics needs to be listed.

I furthermore find it misleading to use 1 standard deviation in Fig. 3 and 4 to represent the variability in the data. The 1 s.d. curve is only truly representative of the data distribution if the data are normally distributed. In my experience, spectral measurements at any particular wavelength more often tend to be skewed in one direction or the other. Given this issue, I find the upper and lower percentage errors much more informative (one could still use the +/- 34.1% quantile around the mean to remain close to the 1

s.d. idea).

In Fig. 4, it is confusing that the error curves for the different sampling curves overlap and look exactly the same (both exactly the same type of dashed line).

Section 3.3 brings back the importance of my point above about proportion of different polymer types in the microplastic samples. Given the measured virgin polymer plastic curves, one could perform a spectral unmixing analysis of the dry and wet microplastic samples to determine proportion of different plastic types. One could then validate this separately by analyzing the microplastic samples down to plastic type. Maybe it doesn't make a difference to know what the different proportions of polymer types are in a sample, but I haven't come across a convincing study yet that makes this point.

Technical Corrections

No technical corrections were found needed.