I thank Dr. Santiago Gassó for his kind words and comments. My responses are given below.

Thanks very much for this interesting work. I welcome the revisitation of the global dust studies as satellite and modeling improve, it is always needed to reevaluate the subject. Also, big picture analysis of dust activity in the context of climatic indexes as shown here are always welcomed. Without providing a long review, I'd like to add a few comments and clarifications which I believe are in order and if the author (or editor) thinks so, I think it would strengthen the paper. My main comment is that the title of the paper conveys an idea that it is not quite consistent with the evidence shown in the paper. Largely missing in this paper is the subject of dust activity at high latitudes (HLD for short) and with this regard, this is an important omission of an important development in the last few years with regards to global dust characterization. Here I list a few sources of information regarding HLD that illustrate my points:
A.1 A major review on the subject was published by Bullard et all (2016). In addition, a large database of publications on the subject can be found here https://icedustblog.wordpress.com/publications/ (mostly references related to Green-land and Iceland dust activity)

Response: HLD is an important topic that deserves a special look, due to the unique geomorphology of high-latitude sources and local impact of HLD, as demonstrated by Dr. Gassó and his colleagues. Due to the length limit of the manuscript, I only include three most important dust source areas (North Africa, Middle East, East Asia) in section 5. Many other areas, including Central Asia, North, Central, and Southern America, and Australia, are not included. But, the global analysis in section 4 is based on the aggregated data from the entire world, including the stations of high latitudes which meet the quality control requirement described in the paper. See Fig. 4 and 5 for the decadal mean dustiness at the station level, which include a number of stations in high latitudes (e.g., Iceland). The dust dataset generated from this study has been made publicly available at https://github.com/ixnix/duISD, which includes all stations around the world, include high latitudes. Anyone is welcome to use the dataset to look at their region of interest.

A.2 The satellite data used in this study (MODIS data from the Voss and Amato database) is only characteristic of observations from 45S to 50N, thus it does not include any of the high latitude dust sources reported in the studies from the previous section.

Response: The MODIS dust optical depth (DOD) dataset by Voss and Amato (2020) only covers low- and mid-latitude areas, which have the most important dust sources in terms of the contribution to annual mean dust emission. As shown in Table 3, the MODIS DOD has a fairly strong correlation with the global mean dust event frequency and extinction coefficient derived from weather stations.

A.3 Surface Visibility and Synop codes have been successfully used to characterize high latitude dust activity in Iceland (see above blog for references) and in Patagonia (Gasso and Torres, 2019, Gasso et al, 2010, Gasso and Stein, 2007)
I believe that just an appropriate adjustment of the title is needed in order to reflect that this study is not global.

Response: see my response to A.1.

In addition, where are a few clarifications that jumped out when reading the paper:

B.1) What is the time resolution in the model-satellite comparison? specifically is the model sampled at the same time of the model overpass? This information would be useful to guide future research based on your analysis.B.2) What is the density of stations used in this study? what regions are not well captured by the surface and satellite data?

Response: The comparison between MODIS-derived and model reanalyzed DOD does not take into account the collocation in space and time. They global mean DOD shown in Fig. 7 is calculated simply as the global average of each dataset, as one normally would do in using these datasets in global analysis. A collocation-based comparison of MODIS vs. models is most useful to evaluate the performance of model reanalysis, which is outside the scope of this study. The station map is given in Fig S1 and S2, and can be also seen in Fig. 4 and 5. Comparing Fig. 10 of Voss and Amato (2020) with Fig. 4 of this study shows that weather stations and satellite both have good coverage of North Africa, Middle East, East Asia, Central Asia, and others, which explains the good agreement between them in the interannual variations (Table 3).

B.3) In figure 4, there is a singular dot in South America, possibly in Chile or Argentina. From my own work, I am familiar with the station Tinogasta in Argentina (by the Andes mountains where this dot is located). this is station is consistently biased to report more dust activity than actually is. I found this out by talking to Argentina's weather bureau central data archive manager. I suggest removing such point.

Response: Thanks for pointing this out. After a quick check, station Tinogasta (AR) is not included in Fig. 4 and 5.

B.4) Is there a consideration for the fact that a large amount of dust activity occurs in cloudy conditions? Satellite polar observations are biased low not only because1-2 obs per day in a given cite but also because cloudiness, which tends to be more pervasive towards higher latitudes. See Gassó and Torres (2019) for more on this. I believe that all these issues can be easily addressed and turn this fine work into a more complete study.

Response: There is no doubt that clouds is one factor among many that contribute to the disagreement between satellite-derived dust record and surface weather stations, as well as models. In section 4.2 the manuscript includes some discussions on the comparison. The global mean dustiess variation resembles that of North Africa as the world's biggest dust source, where satellites are less affected by clouds than in mid- and high-latitudes.