

Dear Mr. Editor,

We would like to thank you and the reviewers for the corrections and comments, which have improved the paper considerably. We corrected the language and logic in the manuscript regarding your suggestions. The synoptic codes were explained better and a reference to the WMO's Manual on Codes was added.

The method to calculate the dust day frequency in this manuscript is identical to other dust studies. It is likely that the terminology is confusing the readers. "Dust day" is a unit for the determination of dust day frequency (each dust day is calculated only once for all stations together, the number of the stations does not affect the overall frequency). "Dust observations" characterizing the "dust events" can be several per day and therefore DE meteorological parameters are based on the dust observations, not dust days. Detailed explanation on this is stated in the answers to your comments here below.

We are confident that this study will attain the interest of many scientists and will be positive for the reputation of your journal as well as the authors.

Yours sincerely,
Pavla and the co-authors

Detailed answers to Editor:

Abstract

The sentence about the codes was removed.

Introduction

We wanted to show that the dust is not only suspended during warm periods as stated in the sentences before. We added the words "contrarily" and "in the past".
"Contrarily, cold and winter periods were of higher glaciogenic dust deposition than warm periods in the past (Ganopolski et al., 2009)."

2.1 Meteorological data and PM measurements

Comment 1: Reference for the synoptic observations from the WMO was added.

Comment 2: The part of the sentence with "manually obtained observation" can be omitted here, because we stated this earlier in the paragraph (Visibility).

Comment 3: Sentence homogenized.

Comment 4: "Daily dust concentrations were correlated with the minimum visibility reported from dust observations during the preceding 24 hours." The filter from the Storhofdi station is being analyzed only once a day, giving 24-hour mean dust concentration (the dust event can be shorter than this). However, dust observations are repeated each 3 hours giving different visibility values as the dust event is developing. Therefore, we decided to use the lowest dust visibility reported from such event.

2.2 Analysis

"Dust event (DE) refers to the dust observation." This sentence (definition) was required in the method section by one of the reviewers. The climatology of DE is based on meteorological observations during the dust observations (!not dust days -

that is a different unit). Basically, dust event and dust observation is a synonym in this context. The sentence can be omitted.

3.2.2. Seasonal patterns in meteorological parameters of dust events

The numbers of Figures 7 and 8 were switched to follow the numbering in the text.

3.2.3 Dust event classification and meteorology

“About 18 % of dust events in S Iceland were observed at more stations in the same time (two stations: 12.5 %, three stations: 3.4%, four or more stations: 1.5%).

Comment: This is something I was wondering all the time. It seems you are just adding dust events for all stations. That means that if you have more stations, you will get a higher DE frequency. That doesn't seem to make any sense to me. For instance, some of your stations start later - how does this influence your time series (Fig. 2)?

Answer: As defined in the methods – A “dust day“ is a day when at least one station recorded at least one dust observation. The dust frequency is therefore solved with a special unit, the dust day. One or more stations together reporting the dust observations during one day will always result as one dust day (as depicted in Figure 2 left). Figure 2 right, the stations individually, of course show the frequency at each station separately, resulting in showing the same dust day at different stations. If you summarize the dust days at the stations in the right graph, you would end up in about 18 % higher number of dust days than is depicted on the left graph. This whole study is based on the dust day frequency from the left graph. The dust day frequency is not based on adding dust days because more stations are employed. However, the co-observation percentage is only to show how large the dust events were and how are the stations located downwind from the dust sources. The most active stations were in work for the whole period. Please note that the DE meteorology – DE temperature, DE wind speed, must have been based on dust observations (can be several per day), not dust days. Dust day is just a frequency unit.

To avoid this confusion, we rephrased the sentence to “About 18 % of dust days..”.

4 Discussion

“An annual mean of 34 dust days recorded in Iceland is comparable to dust studies from the active parts of China (35 dust days yr⁻¹, Qian et al., 2002), Mongolia (40 dust days yr⁻¹, Natsagdorj et al., 2003), and Iran (Jamalizadeh et al., 2008).”

Comment 1: But how can you compare this with your values? They are totally dependent on how many stations you have! It seems for individual stations your numbers are much lower.

Answer: As explained above. The dust studies around the world are based on a special unit, a dust day, to eliminate the differences of the size of the dust-station network in different regions. One station reporting one dust observation in the area of thousands km² (=1 dust day) equals to ten stations reporting 8 dust observations per one day in the same area (=1 dust day). Therefore the studies can be compared. This study, as confirmed by small station network in NE Iceland, show that even few stations report high numbers of dust days (numbers do not count up one dust day at two stations as two dust days!).

Comment 2: “The main drivers were strong winds during periods of low precipitation, enhanced by limited water holding capacity of the materials and rapid drying, hence the dark colour of the surfaces.”

What do you mean here? Visually, a dry surface is normally lighter.

Answer: Rephrased.

“The main drivers were strong winds during periods of low precipitation, enhanced by limited water holding capacity of the materials and rapid drying of the dark-colour surfaces.”

Comment 3: Taklamakan Desert, of course, changed!