

General Comments

The paper tackles an important question: The change of the released aerosol size distribution with increasing wind speed in dust storms over deserts. The paper also is to be praised in showing again, that and how 0.3 μm particles are lifted and are present in the air over the deserts. This questions the use of the term “accumulation mode” in the literature. That term implies that this size range is a kind of a dump, a dump for coagulated particles and for filling up more and more other particles. The majority of the particles in that range are produced from erosion and/or blasting effects instead. It is a range where organics might condense on, because of the large surface available.

Specific Comments

This review will not be limited to praise, it will encourage including further important details and showing some weak points.

- The residence time of particles of 20 μm is about 1 day. Only particles smaller than 3 μm could be suspended for several days and transported very far from their source.
- Page 5552, “The mass of PM₂₀ present ...” - this phrase reflects only the view of a soil scientist. Atmospheric scientists see it more complicated.
- Page 5554, “If the direction of squall lines is usually centred around 90°N” – To me this phrase remains cloudy.
- Page 5557, if both instruments are not reliable and cannot be compared, than use only one of them for indicating the onset of saltation.
- Page 5557, “Assuming that PM₂₀ dust particles are light enough to follow air movement perfectly” – This phrase shows how important wording is. 20 μm particles (those are included in the term PM₂₀) are impacted easily and do are not light enough to follow the air movement easily. Instead 0.3 μm particles (they are also included in the term PM₂₀) do follow easily the air movement.
- Averaging over 15 minutes. The whole timing needs careful considerations. Is the averaging time short enough for the calculations of the vertical flux?

One of your main questions is the change of the size distributions with changing wind velocity. So please show size distributions!

- Fig. 2 – That Figure could be omitted. The correlation is very low, as indicated in the text. Since the instruments are used only for qualitative determination of the beginning of a dust storm, one instrument is sufficient.
- Fig. 3 – The events are too short to give sensible data within 15 min average. This refers to my question above about the timing.

Technical Corrections

- Fig. 6 – It is irritating in having directions (in degree) on a 0 – 750 scale, despite directions only could be 0 – 360°.
- Page 5564, “ 10^5 particles/ m^2/s ”. Use same units as in the Figure referred to: #/ cm^2/s .