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Atmospheric Chemistry and Physics Discussions

Interactive comment on "An observation-based approach to identify local natural dust events from routine aerosol ground monitoring" *by* D. Q. Tong et al.

Anonymous Referee #2

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The manuscript presents a work of potential interest to other people working on the subject given the fact that recent papers are demonstrating how resuspension processes are important contributors to PM10 in both rural and urban sites. However my main doubt over this paper relates to whether it is innovative enough. The five indicators detailed by the authors as providing a methodology to follow for identifying local natural dust events are simply routine for those of us working in this subject and obviously do not need to be presented as something new. Other aspects that need improving before the manuscript would be ready for publication mostly relate to the lack of discussion on the data. Section 4.3 on "Discussion" does not seem to match the main results of the paper, but instead focuses on the temporal variations and frequency of

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the events identified. Some more detailed recommendations are shown below:

- All through text. Be consistent Sonora or Sonoran Desert, also Chihuahua or Chihuahuan Desert.

- Page 4284. Why have authors chosen a >0.35 PM2.5/PM10 ratio as indicative of non-local dust sources?

- Page 4284. Could not Mexican Desert dust have a lower PM2.5/PM10 ratio than more local USA desert areas having travelled longer distances?

- Page 4284. "....soil dust aerosols are associated with... crustal elements, which differentiate them from aerosols from biomass burning, volcanic ash..." Volcanic ash is also associated with crustal elements. What exactly do you mean by crustal elements?

- Page 4288. Line 5 "2000-20007"

- Page 4289. "several large dust storms", be more precise, how many? If only 3 cases are described later it is important to know how representative these 3 episodes really are.

- Page 4290. Lines 15-16. Why did sulphate and nitrate reach maxima when dust storm occurred?

- Page 4291. It is not clear to me how authors how use cluster analysis. Are they dealing with daily data? How many data points are used in this cluster analysis?

- Page 4291. Why has been GUMO1 site chosen to show these patterns compared to the other sites

- Page 4294. Line 5. I thought all sites were located within Natural Parks (see section 2.2)

- Page 4297. Line 6. This reference does not appear in the reference list.

- Reference list. Authors should not cite papers that are "in review" or "in preparation"

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as they may not be published.

- Figure 2. Vertical axes. Is the top “Concentration in PM10”? what does “Fraction in PM2.5” mean?

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 4279, 2012.