

Interactive
Comment

Interactive comment on “Comment on “Observing desert dust devils with a pressure logger” by Lorenz (2012)” by A. Spiga

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I would like to thank R. Lorenz and the anonymous reviewer for their constructive comments. I replied to their suggestions in the revised version of the paper.

Reviewer 1 (R. Lorenz)

I recognize this is just a short note, but a brief statement on how this organized convection is expected to vary over the course of the day...

This is now addressed in section 2 by an additional sentence: “From early morning

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(local time 0900) to late afternoon (local time 1600), convective cells progressively widen, following the increase in PBL depth (see e.g. Figure 2 in Spiga et al. (2010))."

... and how it is influenced by the ambient wind (do high winds destroy it?) would also be useful.

This is now addressed in the last paragraph of section 2: "When the background wind is particularly strong, it is even possible that convective cells lose their polygonal structure to become linear rolls: this change of convective regime could be monitored through pressure measurements as well."

Of interest to field observers such as myself is whether particular length or temporal scales of interest. For example, if three or more meteorology stations are available, what would be the separation between them that might best characterize the variations - eyeballing the plots suggests maybe a few hundred meters, but it might be useful if the paper can be explicit on suggested measurement strategies.

This is now addressed in the last paragraph of section 2: "If three or more pressure loggers are available, this will allow observers not only to increase the probability to capture pressure drops associated with dust devils, but also to better check the consistency of pseudo-periodic signatures associated with convective cells, and their evolution from morning to late afternoon. In terrestrial arid regions, based on the principle that the width of convective cells scales with PBL depth, we could recommend a spacing between pressure sensors of typically 300 – 500 m; this spacing could be raised to even 700 – 1000 m if the focus is on the peak of convective activity in the afternoon."

Reviewer 2

The topic in this commentary is very timely due to the recent landing of the MSL on the surface of the Mars as there now is a pressure sensor on-board the spacecraft that

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should be able to bring the predicted pressure fluctuation periods to the test. It will be very interesting to see if the fluctuations discussed in this comment are observed.

This is now addressed in the last paragraph of section 2: “Our conclusions from LES could also be tested against pressure measurements on Mars, e.g. on board the Curiosity rover operating since August 2012 (Grotzinger et al. 2012). If a network of pressure loggers could be deployed on Mars in the future, the spacing between each pressure sensor in a given area would have to be larger than on Earth to characterize the deeper PBL convection and wider convective cells.”

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 2, 593, 2012.

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2, C201–C203, 2012

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