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Solid Earth Discussions

Interactive comment on "Radon signals at the Roded site, Southern Israel" *by* G. Steinitz and O. Piatibratova

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We thank the reviewers for their constructive inputs. Below are our responses.

Referee No.1

In the recent years we indeed did publish results on radon signals from several monitoring sites in southern Israel. It is a fact that the interpretation of the temporal variations of radon in geogas is disputed. Presentation of additional results of long time series associated with in-depth geophysical analysis will help to constrain the debated issue. Comparing the results from Roded with those from the other locations in the same arid environment shows that: a) Different signal patterns occur at different sites; b) Unique variation patterns, in the time and frequency domains underlie the different patterns;

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c) In general – the complex of temporal variations of radon at these sites cannot be explained by above surface atmospheric drivers, and d) The latter patterns are both similar and different among the sites. All these are interpreted to imply that a common geophysical driver is at hand, which is manifested locally as somewhat different patterns.

We kept Figure 2. It serves, among other things, to demonstrate and justify that the prominent SDR signals are neither an erratic phenomena nor an instrumental artifact.

Concerning the distribution of SDR signals (Fig. 8): We are not aware that signals having such an exceptional form are reported from radon in soil. This is the second documentation of such signals and what is important is that their daily periodic pattern differs from that described from the Gavnunim site.

The remark concerning the detector configuration and the SDR signal (Fig. 10) is important. It is clear that radon enters/leaves the sensing volume (measuring cup of $\sim$50 cc) of the alpha detector by diffusion. We agree that the rise and decrease rates of the SDR signal seems to be incompatible with a diffusion process into and out of the measuring cup. We are aware of this issue also in the case of the SDR signals occurring at Gavnunim. We have the notion that the rise and decrease of the alpha radiation in the measuring cup is not reflecting variations of radon in the geogas next to the detector. Thus maybe a different process is at hand, but we cannot pinpoint it with the present data. We therefore prefer to note this in the frame of this discussion and leave this important issue open for further investigation.

The remaining specific comments have been addressed in the corrected manuscript.

Referee No.2

The introduction was reorganized, modified and repetitions were corrected.

We modified Figure 4 and added a smoothed curve to illustrate the long term variation within the noisy signal.

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In Figure 10 and in the text we clarified the correction made for the decay of the decreasing limb.

The remaining specific comments have been addressed in the corrected manuscript.

Interactive comment on Solid Earth Discuss., 2, 161, 2010.