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Dr Robyn Schofield, Associate Editor
Atmospheric Measurement Techniques

Dear Dr Schofield,

Please find below our detailed responses to the technical corrections requested by Dr Roberto Salzano regarding our paper: “Identifying ‘persistent temperature inversion’ events in a Subalpine Basin using Radon-222”.

We would like to thank Dr Salzano for his constructive feedback. All comments are addressed individually below.

Best regards,

Dafina Kikaj
(on behalf of all co-authors)

Response to Roberto Salzano’s comments, salzano@iia.cnr.it

I would thank authors for the effort in revising the manuscript and I would highlight some minor comments that could increase the readability of the manuscript to a not-specialized reader.

Figure 3 Please show dates in the x-axis of panels 3a and 3b, the x-axis of panel 3c can confuse the reader since the number 12 (December) could be the beginning, the middle or the end of the month...

As suggested, to reduce ambiguity we have changed the date format on the x-axis of Figures 3, 4, 6–11.

Figure 5, there is a lack of data in December? Please specify in section 2.3 line 27 the date and fix the dates in x-axis of figures 3,4,6-11. Fig. 3-4 winter (1 Dec - 28 Feb), Fig.7-10 spring (1 Mar - 31 May), Fig. 8-11 summer (1 Jun - 31 Aug) and Fig. 6-9 autumn (1 Sep – 30 Nov).

Yes, there is a lack of data in December, the measurements have started on 14th of December 2016. We have specified the dates in the section 2.3 and also in the x-axis of Figures 3, 4, 6–11.

Figures 3,6-8, I should be able to connect easily the defined variables to the text of section 2.3.1... While from figure 3a I find CR_n-observed, CR_n-advected and CR_n-subtracted, in panel 3b I read CR_n-synoptic and CR_n-diurnal. These variables are cited in the caption but they cannot be found easily in the text:

is CR_n-observed cited in page 6 line 36?

is CR_n-advected cited in page 7 line 16? I'm pretty sure and I ask to indicate the variable there...

is CR_n-subtracted cited in page 7 line 29? Yes, please use the same symbol (substracted CR_n or CR_n-subtracted)

is CR_n-synoptic cited in page 7 line 30? Yes, please use the same symbol (synoptic CR_n or CR_n-synoptic). I understand also that "synoptic" = "advected" - "subtracted"...I think that the declaration of synoptic could be supported by an equation...Please change the color of synoptic in figure 3 and similar...It can be confused with advected...

is CR_n-diurnal cited in page 7 line 11?

Thank you for pointing out this ambiguity. In the final version of manuscript, we have used the same symbols in the text as are in the figure captions (C_{Rn}-observed, C_{Rn}-advected, C_{Rn}-subtracted, C_{Rn}-diurnal). The colour of C_{Rn}-advected is changed from light red to light blue.

Figure 3b authors show + σ (CR_n-diurnal) in the legend and then σ just above the dashed line, I think they are the same....Call them in the same way or remove σ and indicate only the value...

The + σ has been printed on each of the threshold lines (dashed lines) the same as it is in the legend + σ (C_{Rn}-diurnal) of graphs.

Pay attention to σ and μ in Figures 3,4,6-11 since σ and μ are described also in page 7 line 31 and page 9 line 17.

Done. Thank you.

P1 Line 12 ... new radon-based method (RBM), based on single-height 222Rn measurements...

Done.

P4 line 27 what do you mean with "($\pm 25\%$; Jacob et al 1997" ? Radon emanation in the Earth crust?

For the clarification we have rewritten the sentence as follows: "(1 atom cm⁻² s⁻¹ $\pm 25\%$; Jacob et al 1997..."

P5 line 10 Julian and Kamnik-Savinje Alps?

Done. Thank you.