

## ***Interactive comment on “Comparison of one- and two-filter detectors for atmospheric $^{222}\text{Rn}$ measurements” by Y. Xia et al.***

**Anonymous Referee #2**

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The paper shows the disequilibrium between radon progeny using a specific one-filter method and a specific two-filter radon method in Schaunisland, but in my opinion is far from showing a comparison of general methods. The one-filter monitor estimates radon equivalent concentration based on the assumption of equilibrium between Rn-222 and Po-218 and Po-214 activity in the atmosphere. There are other one-filter radon progeny monitors that can measure each radon progeny using, for instance, alpha spectrometry, and can estimate better radon concentration using Po-218 concentration, which is in a better equilibrium with radon gas. Therefore, I suggest that the title should be modified to something like "Study of Radon gas and Radon progeny disequilibrium in the Schaunisland station" and the text should be consequently revised on this objective and not in a general comparison of one-filter and two-filter methods.

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I agree with the comment of RC C17 regarding the lack of information of the one-filter method. I would suggest the authors to be more rigorous regarding the specific radon progeny device used in the work. Amongs other improvements in the description, the authors should considerer that one week measure period can accumulate a significant quantity of thoron progeny on the filter. From the text radon progenies (6.00 MeV and 7.69 MeV) are measured with the lower alpha's counter and Thoron progenies (6.78 MeV, 6.09 MeV and 8.79 MeV) are corrected using the high energy alpha's counter. From the energy range of radon and thoron progenies and the description in the text, it is difficult to see how the radon and thoron progenies energies are separately counted. A more deep description of this method in order to give the reader about drawbacks and uncertainties has to be included.

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