

Interactive comment on “Atmospheric removal times of the aerosol-bound radionuclides ^{137}Cs and ^{131}I during the months after the Fukushima Dai-ichi nuclear power plant accident – a constraint for air quality and climate models” by N. I. Kristiansen et al.

Anonymous Referee #2

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I found this paper to be well written and provides new insights into residence times for aerosols in accumulation mode. This is a good example where new data are used to gain knowledge outside the scope if the primary purpose of the data.

The title and abstract clearly reflects the content of the paper.

The methodology is well defined, and I find it interesting with the multi-box approach to overcome that 50% of the CTBTO stations that do not have co-located measurements

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of the nuclides of interest.

The uncertainties are carefully handled and most of the possible objections to the methodology are covered in a good way.

I very much appreciate the guidance in the text given to the reader when referring the content of various figures.

The authors discuss the possibility that early measurements may provide shorter residence times than the full data-set and its implication for estimate of the initial Cs/Xe relation (p. 12342-). Reference is made to high observed values in figures 3c and 4b. The authors avoid the tempting idea to follow these few data to the time zero intersection that would give a Cs/Xe ratio of roughly $1\text{e-}3$, that then would be more into agreement with the assumptions in Stohl et al, 2012. I couldn't restrain myself for doing so but it is honorable to the authors not to try.

The references are properly made and relevant. The paper provides a good list of the literature that deals with aerosol life-times over a number of decades.

— Error though:

In page 12342 last paragraph.

The fact that our radionuclide ratios extrapolated to the time of the [missing word] are so much lower ...

I guess the missing word should be <release>, or <assumed release>.

— Suggestions:

I was at first a bit confused at the notation <enhanced values> (p. 12336) that made me as a reader shortly a bit lost. Later on you use <enhancement over background>, that you may consider to use right through the paper.

The same is then valid for Fig 2, the legend <Enhanced> may be replaced by e.g.

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<Over background>, that also comes closer to the figure caption.

On page 12334, last paragraph, you describe the nature of the CTBTO data (These measurements are unique ...). It could be of interest to attach a reference, if available, to the statements in this sentence.

You may add something about the motivation for the multi-box approach in page 12337, second paragraph ("The first approach uses a multi-box ..."), as I understand it related to that only 50% of the stations have co-located Cs, I and Xe measurements. But this may be obvious anyway.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 12331, 2012.