

## ***Interactive comment on “Measurements and modelling of airborne plutonium in Subarctic Finland between 1965 and 2011” by Susanna Salminen-Paatero et al.***

### **Anonymous Referee #2**

Received and published: 2 March 2020

Of whole text my doubts arises only regarding the Pu-241 measurements observed for Fukushima time. From what is said in the manuscript, it remains for me unclear how exactly and when the results for Pu-241 in the samples from the year 2011 were obtained? In case of Pu-241 determination by ingrown of Am-241 the whole technical details of history of sample are important. What is obvious to me is that the Authors noticed the presence of 5.5 MeV alpha peak, which they did not attribute to Pu-238, what suggests, that samples were measured twice and 5.5 MeV peak was smaller in first measurement. The results from first measurement were used for determination of Pu-238 and after some years the same Pu source was re-measured and change of count rate in 5.5 MeV peak was interpreted as Am-241. Only the sampling time

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points to Fukushima as origin. I will be much happier with the text if all those technical data (i.e. when Pu was separated from Am/Cm and when measured and when re-measured) data will appear in a small paragraph concerning Pu-241 measurements in "Experimental" section. Please note, that in fresh spent nuclear fuel the main actinide alpha activity comes from Cm-242 ( $T_{1/2}=160$  days) and it is a bit striking, that this isotope was not detected along with Pu in reports on finding the Pu of Fukushima origin at the distances of 10 000 km. The lack of Cm-242 suggests something else than fresh release from nuclear reactor.

Besides my doubts on Pu-241 (or rather Am-241) presence interpretation as Fukushima origin I like whole manuscript. The first part presents history of contaminations and the modelling part compares the past events with scenarios of possible future accidents. I think such concept is logical and answers to questions which come from fears on possible nuclear accidents.

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-954>, 2019.

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