



«Influence of rainfall on the temporal variability of atmospheric beryllium-7 (^7Be) activity concentration»

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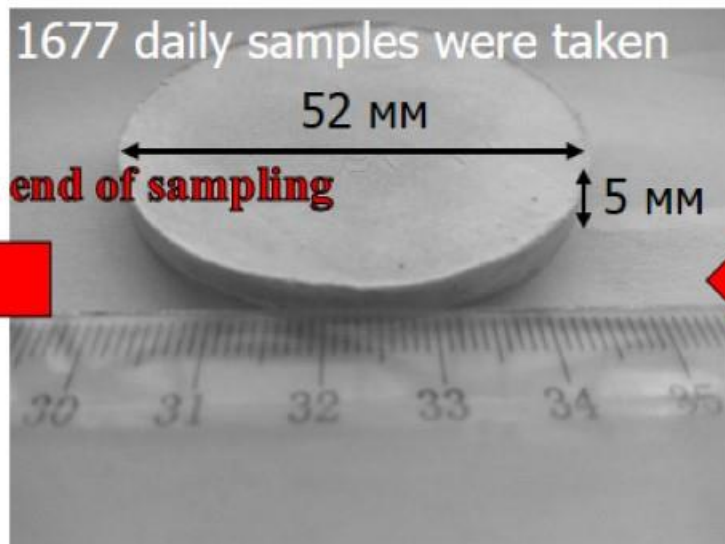
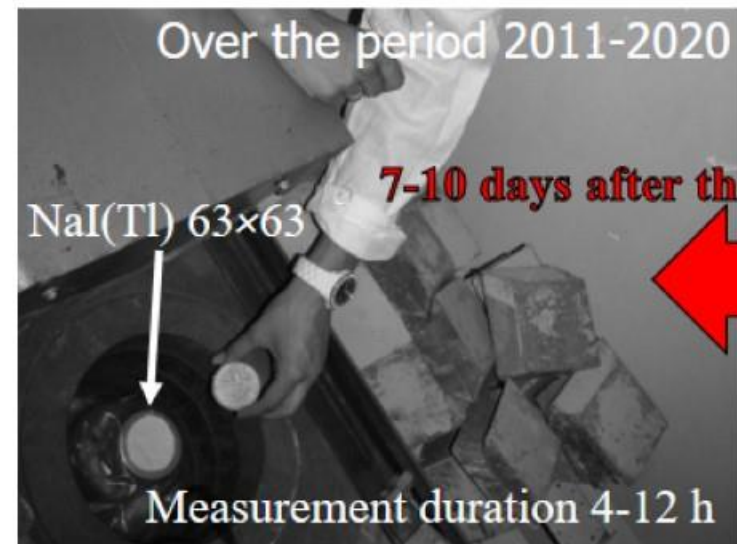
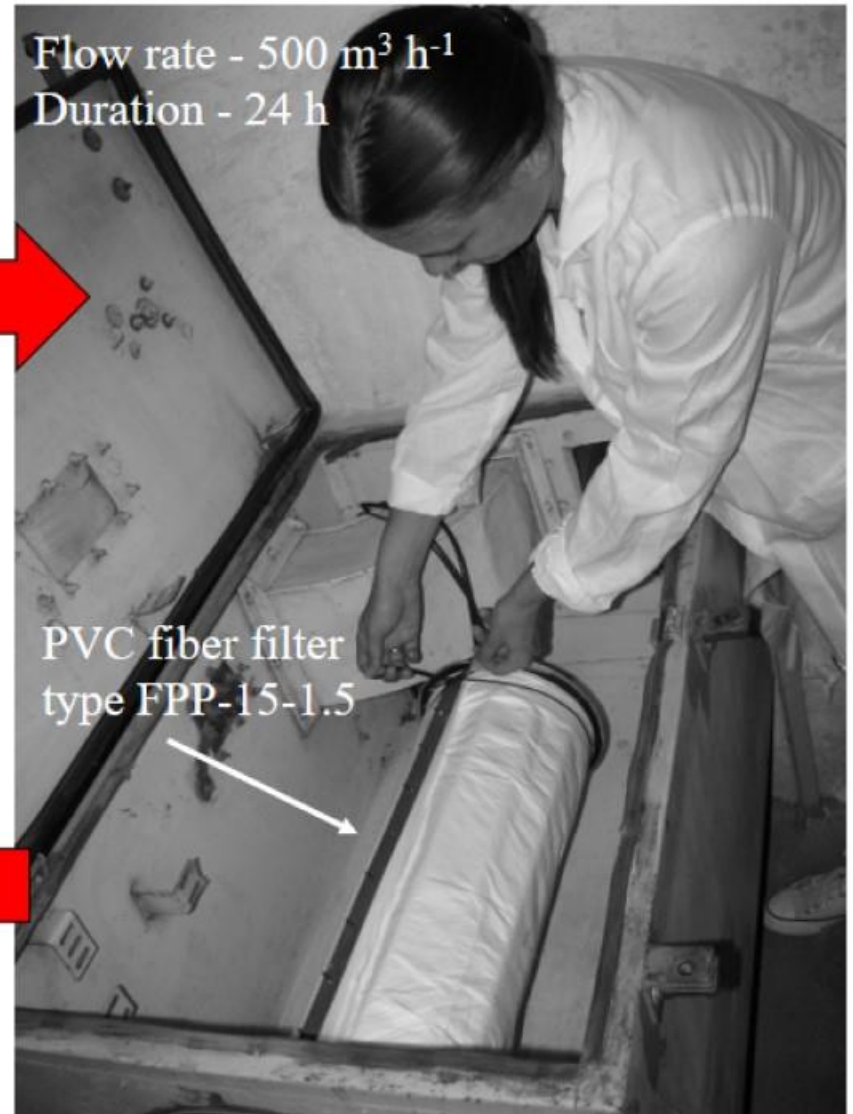
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Beryllium-7 (^7Be) is a naturally occurring radionuclide of cosmogenic origin with a half-life of 53.3 days. It is produced in the atmosphere as a result of the spallation of light atmospheric nuclei (N, O) by cosmic ray flux. After formation, it is rapidly adsorbed on atmospheric aerosols. It is removed from the atmosphere mainly by wet deposition. With the advantage of a short half-life, ease of determination, and a unique source function, ^7Be is widely used as a tracer in studies of physical processes occurring in the atmosphere and in the ocean on time scales from synoptic to seasonal.

The aim of the work is to obtain quantitative estimates of the influence of precipitation on the temporal variability of the ^7Be activity concentration.

Materials and methods

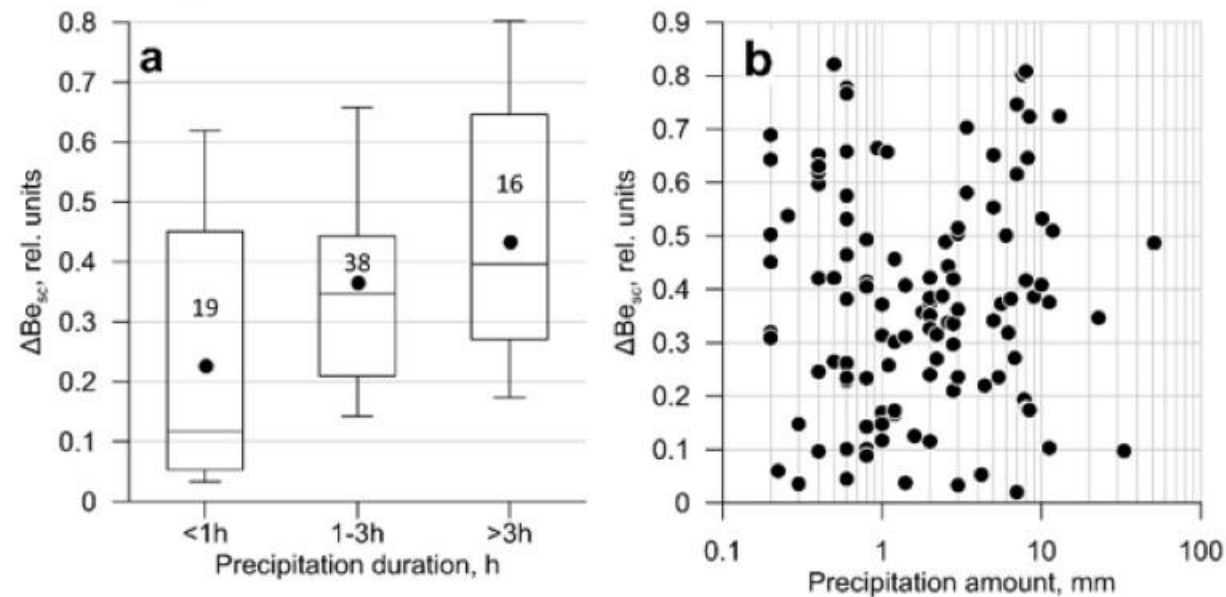
The samples of atmospheric aerosols were collected from the roof of the Marine Hydrophysical Institute of RAS (~12 m above ground level and ~20 m above sea level).



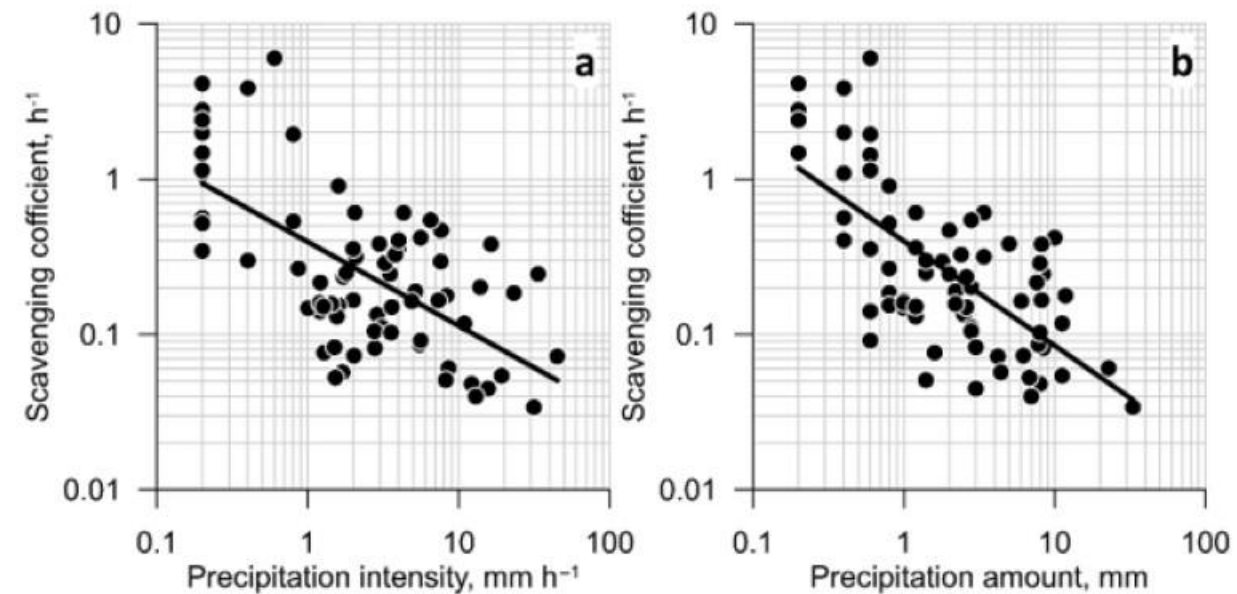
7-10 days after the end of sampling

Results and Conclusions

1. Daily values of ^7Be activity concentration decreased by 2–82% on the first day with precipitation. It was found that an increase in the duration of precipitation leads to a more significant decrease in the daily ^7Be activity concentration. It seems that the ^7Be scavenging ratio does not depend on the precipitation amount on the daily time scale.



2. The ^7Be scavenging coefficient values varied from 0.03 to 6.0 h^{-1} and averaged $0.6 \pm 1.0\text{ h}^{-1}$. It was found that an increase in the precipitation intensity or their amount leads to a decrease in the ^7Be scavenging coefficient.



3. The atmospheric ^7Be activity concentration recovers within 1–2 days after a day with precipitation. The mean value of the ^7Be reload coefficient was $0.94 \pm 0.34\text{ d}^{-1}$. It was found that there is no statistically significant relationship between the changes in the reload coefficient and local meteorological parameters on the first day after precipitation.

THANK YOU
FOR YOUR ATTENTION!

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