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Air radiological monitoring in Northern Algeria: spatial distributions, meteorological influence and air masse's origin

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Abstract
By its geographical position, Algeria in general and its Northern part in particular is not far from any radioactive contamination originating from nearby countries, especially industrial ones.
The activity concentrations of natural radionuclides (namely 210Pb and 7Be) were measured by direct counting gamma spectrometry of particulate matter filters collected at two different altitude sampling sites in Northern Algeria. In particular, the two sampling sites were Algiers low altitude site , where the samples were collected over a four-year period (June 2014-June 2018), and Chrea high altitude site , with sampling over a four month period (Nov.2017-Feb.2018).
The activity of 7Be shows high values in summer and low values in winter, while the seasonal 210Pb activities increase during summer and decrease during winter and spring.
Correlations between activity concentrations of both radionuclides, meteorological parameters and sunspots number (SSN) in Algiers were studied by simple regression and principal component analysis using Varimax rotation. These methods identified a negative correlation between 7Be and SSN, while both radionuclides are negatively correlated with the amount of precipitations, as linked to the effect of wet deposition over the carrier-aerosol.
210Pb and 7Be levels observed at the two different altitude sites were compared during the period of contemporary sampling.
Finally, the air masses sources and pathways responsible for high concentrations of 210Pb and 7Be at both sites were investigated through cluster analysis of HYSPLIT-4 back-trajectories.
Keywords: natural radionuclides, air, Northern Algeria, HYSPLIT 4

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