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Radon flux at King George Island, Antarctic Peninsula.

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Abstract

Fluxes of 222Rn from the ice-free terrain to the atmosphere were measured directly, for the first time, at the Brazilian Antarctic Station Ferraz during the summer field campaign of 1998/99. Average value for the flux was 7.7 +/- 4.8 x 10(-2) atoms cm(-2) s(-1) and it ranged between 0.21 x 10(-2) atoms cm(-2) s(-1) and 28 x l0(-2) atoms cm(-2) s(-1). The average flux of 220Rn was estimated to be 23 atoms cm(-2) s(-1), using a combination of two techniques: nuclear track detection and alpha spectrometry of radon daughters. It was found that the production of radon by uranium (41.54 + /-7.17 Bq kg(-1)) and thorium (57.97 +/- 12.14 Bq kg(-1)) equivalent soil contents, and a diffusion coefficient derived from experimental data for the local terrain could account for this average flux. Nevertheless, the large surges of 222Rn in the atmosphere frequently observed for that area could not be explained by this flux only.

Keywords: Antarctic Regions, Atmosphere, Environmental Monitoring, Radon, Radon Daughters, Seasons