**Isotopic signatures of the plutonium sources in the Antarctic environment**

**Katarzyna M. Szufa,1,\* Jerzy W. Mieteski,2 D. Sala,** 2 **and Maria A. Olech 3,4**

*1 Institute of Physics, Jan Dlugosz University in Czestochowa, Armii Krajowej 13/15, 42-200, Czestochowa, Poland University, 32-000 Krakow, Poland*

*2* *Institute of Nuclear Physics, Polish Academy of Sciences, Radzikowskiego 152, 31-342 Kraków, Poland*

*3 Institute of Botany, Jagiellonian University, Gronostajowa 3, 30-387, Kraków, Poland*

*4 Institute of Biochemistry and Biophysics, Department of Antarctic Biology, Polish Academy of Sciences, Pawińskiego 5a, 02-109, Warszawa, Poland*

\**e-mail:* [*k.szufa@ujd.edupl*](mailto:k.szufa@ujd.edupl) *corresponding/presenting author*

The Antarctic is one the most cold and windy place in the world. For this reason, specific ecosystems have developed there, not found anywhere else. At the same time the Antarctic is considered the cleanest place in the world. Moreover activities involving nuclear radiation such as waste storage or nuclear testing are prohibited. Thus all radioactive pollutants came to the Antarctic with the air or sea water movements. One may therefore ask whether there is a difference between the marine and terrestrial ecosystems of Antarctica? Are there any differences in isotope ratios observed in the terrestrial and marine environments? Could the accumulation of radionuclides by mosses and lichens on land from mainly air result in different isotope ratios than in marine organisms that spend most of their lives in water?

This work is an attempt to answer these questions. 238,239,240Pu was analyzed in over 100 environmental samples. Based on the analysis of plutonium isotope ratios 238Pu/239+240Pu and 240Pu/239Pu, an attempt was made to show the difference between the Antarctic marine and terrestrial environment. Since the contamination in the Antarctic is at a very low level, some measurements showed results below the detection limit. Therefore, in the work an attempt was made to use statistics for censored data to check whether their use provides additional information than using only results above the detection limits.