

Atmospheric Radon Observations on the Antarctic Ocean

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The high sensitivity radon detector was installed on board the Icebreaker Shirase in the 46th Japanese Antarctic Research Expeditions. The atmospheric radon concentration was continuously observed on the Antarctic Ocean from December 3, 2004 to March 19, 2005. The period of cruising the Antarctic Ocean was 15 days in outward cruise, and 38 days in return cruise, and the average radon concentration of an outward and a return cruise was 41 and 58 mBq/m³, respectively. It turned out that the atmospheric radon concentration and the wind speed have strong correlation. When the wind speed was as small as 5m/sec, the radon concentration was 41 mBq/m³, and when wind speed increased with 13m/sec, the radon concentration increased to 68 mBq/m³. The observation radon concentration showed the wind speed dependency still stronger than that of a model calculation. Two radon concentration increase phenomena (Radonic Storm) accompanying with the cyclone were observed. Radon concentration increased rapidly then to 74 mBq/m³ of outward cruise and 120 mBq/m³ of return cruise. According to the global atmospheric transport model, when wind speed is small at 5m/sec or less, there is a rate of the sea origin radon no less than 90%, and the continent origin has only 10% order. On the other hand, at the time of Radonic Storm accompanying with the cyclone, and the South America Continent origin radon increases also to 23%.