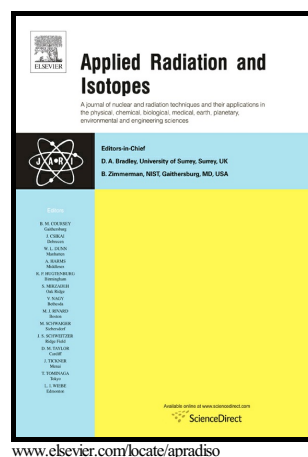


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Particle-size speciation of Pu isotopes in surface soils from Inner Mongolia (China) and its implications for Asian Dust monitoring

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Abstract

To study the applications of Pu isotopes in long-distance dust migration monitoring, Pu isotopes in surface soil of Inner Mongolia have been analyzed using SF-ICP-MS after size fractionation. $^{240}\text{Pu}/^{239}\text{Pu}$ atom ratios ranged narrowly (0.169-0.200) and indicated global fallout character, while $^{239+240}\text{Pu}$ activities increased with decreasing particle size. A spherical model could well simulate $^{239+240}\text{Pu}$ activities as a function of particle diameter when soil particle size was less than 600 μm , and the soil particle surface sorption phenomenon of Pu isotopes in natural soil samples was revealed. Furthermore, $^{239+240}\text{Pu}$ activity in fine particles (sized less than 53 μm) had good consistency with that in atmospheric depositions of Japan since the 2000s, suggesting new Asian Dust sources (i.e. central Inner Mongolia) other than the well-known Chinese deserts.

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