Contribution ID: **34** Type: **Oral Communications**

ORAL PRESENTATION - Plutonium radionuclides in stratospheric and tropospheric air: new evidences from measurements in high altitude aerosols

Friday, 21 September 2012 13:10 (15 minutes)

Here we report some new experimental results on the content of the long-lived plutonium radionuclides (238Pu, 239,240Pu, 241Pu) in the upper tropospheric and lower stratospheric aerosols. Plutonium radionuclides have been injected into the atmosphere by different processes (ex. nuclear weapon tests (NWT), burn-up of the satellite SNAP-9A, accidents in nuclear facilities, etc.). However, stratospheric component stems mainly from high yield (Megaton) atmospheric nuclear explosions and represents the principal source of global contamination with plutonium (Pu). The aerosol samples were collected periodically since 1970 in the frame of the environmental surveillance programme of Switzerland. Air volumes up to a few thousands cubic meters were filtered through cellulose filters during stratospheric flights using military airplanes.
Our measurements show that Pu radionuclides are present in the stratosphere at higher levels than in the troposphere. The isotope ratios indicate that the main origins of Pu in the stratosphere are the NWTs and the burn-up of the satellite SNAP-9A. The lower content in the troposphere reveals that dry and wet deposition removes efficiently most of the Pu within a few weeks to months. This is not the case for the stratosphere where plutonium has a much longer residence time because of its thermal stratification that separates it from the troposphere. Nevertheless, the analysis of aerosols collected during the passage of the Eyjafjallajökull volcano ash plume in 2010 revealed high levels of Pu in the troposphere, comparable to the values typically observed in the stratosphere. The explosive eruption of this volcano threw volcanic fine grained ash into the stratosphere that quickly mixed with stratospheric aerosols and then may have transported some stratospheric Pu into the troposphere.

Primary author: Dr CORCHO ALVARADO, José Antonio (Institute of Radiation Physics, Lausanne University Hospital, Switzerland)

Co-authors: Dr BOCHUD, F. (Institute of Radiation Physics, Lausanne University Hospital); Dr FROIDEVAUX, P. (Institute of Radiation Physics, Lausanne University Hospital); Dr STEINMANN, P. (Division of Radiation Protection, Federal Office of Public Health); Dr ESTIER, S. (Division of Radiation Protection, Federal Office of Public Health)

Presenter: Dr CORCHO ALVARADO, José Antonio (Institute of Radiation Physics, Lausanne University Hospital, Switzerland)

Session Classification: Session 13 (cn't of Session 12) - Radioactive elements in the environment, radiation archeometry and Health Physics

Track Classification: Radioactive elements in the environment, radiation archeometry and Health Physics