



EINLADUNG

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VERA - SEMINAR

von

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## **Analysis of Plutonium and Uranium Traces in the Environment**

Plutonium and anthropogenically altered uranium can be found in the environment as a consequence of nuclear activities. The isotopic composition of plutonium reflects the irradiation history of the material. In particular, the isotopic ratio  $^{240}\text{Pu}/^{239}\text{Pu}$  is considered a reliable indicator of the source. Recently, another sensitive fingerprint has been identified in the environmental abundance of  $^{236}\text{U}$ . The  $^{236}\text{U}/^{238}\text{U}$  ratio varies over several orders of magnitude, from  $10^{-2}$  in irradiated nuclear fuel to an estimated value of  $10^{-14}$  in pre-anthropogenic uranium on land surface.  $^{236}\text{U}/^{238}\text{U}$  ratios from global fallout have been measured in the range from  $10^{-7}$  to  $10^{-9}$  in soils and in river sediments. Accelerator Mass Spectrometry (AMS) is the analytical technique which offers the best sensitivity for the measurement of  $^{239}\text{Pu}$  ( $2 \times 10^5$  atoms/sample) and of  $^{236}\text{U}/^{238}\text{U}$  ratios ( $10^{-13}$ ).

We present our results on soil profiles from Nussdorf (Austria), from Dukovany (Czech Republic) and from peat samples collected far away from highly contaminated sites. The measured  $^{236}\text{U}/^{238}\text{U}$  ratios in the soil samples are far higher than expected for pre-anthropogenic land surface and are close to the values attributed to global fallout at other sites. The corresponding  $^{240}\text{Pu}/^{239}\text{Pu}$  ratios are in some cases higher than expected for global fallout (0.17–0.19) which can be ascribed to an additional contribution of Chernobyl fallout. We continue our investigations with "old" peat samples (Gola di Lago and Südtirol) and with an undisturbed vertical profile of peat (Wildseemoor, Germany) to obtain a complete record back to the pre-nuclear age.

**Donnerstag, 23. Februar 2012, 16:30 Uhr**

**1090 Wien, Währinger Str. 17, "Kavalierstrakt",  
1. Stock, Victor-Franz-Hess Hörsaal**