

HK 59: Poster - Anwendungen physikalischer Methoden

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Detection of long-lived Plutonium Isotopes in Environmental Samples by Accelerator Mass Spectrometry (AMS)

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The Plutonium isotopes ^{239}Pu ($T_{1/2}=2.4\cdot 10^4\text{a}$), ^{240}Pu ($T_{1/2}=6.5\cdot 10^3\text{a}$) and ^{242}Pu ($T_{1/2}=3.7\cdot 10^5\text{a}$) are anthropogenic radionuclides emitted into the environment by nuclear activities. Pu is accumulated in the human body and hence, poses a considerable hazard to human health. Due to the long half-lives, these isotopes are present in the biosphere on large time scales and a build-up can be expected. Therefore it is

important to study the contamination pathway of Pu into the drinking water.

At the Maier-Leibnitz-Laboratory in Munich a method to detect long-lived Pu isotopes by Accelerator Mass Spectrometry (AMS) is being developed. AMS requires only few milligrams of sample material, which is a substantial advantage over decay counting techniques. Consequently, more samples from different locations can be taken which is essential when searching for locally increased Pu concentrations as in the Pacific Ocean after the Fukushima accident in March 2011. Samples from different locations in the Pacific Ocean and from the snow-hydrosphere are planned to be investigated by AMS.

The principle detection method using AMS and an overview of the status of the project will be presented.