



Predavanje na Institutu “Jožef Stefan”

Predava:
Pavel P. Povinec

Comenius University of Bratislava, Slovakia

Tema:
»Environmental impact of the Fukushima accident«

The big Tohoku-oki earthquake of magnitude 9 which occurred east of Japan on March 11, 2011 and followed by devastating tsunami with over 14 m height attacked the Fukushima Daiichi nuclear power plant where three reactors under operation could not cool down safely because of the interrupted electricity supply and damaged diesel generators. As a consequence of the accident, significant amounts of radioactive materials were released to the terrestrial and marine environments.

Measurements of activity concentrations of ^{131}I , ^{134}Cs and ^{137}Cs in airborne aerosols were carried out in the Bratislava air during the period of March – June, 2011. Two maxima found in radionuclide concentrations should be related to the complicated long-range air mass transport from Japan across the Pacific, the North America and Atlantic Ocean to Central Europe as indicated by modeling exercises. Hysplit backward trajectories and meteorological data were applied for interpretation of activity variations of measured radionuclides observed at the site. The Fukushima data were compared with the data obtained during the Chernobyl accident and in the post Chernobyl period. Estimated radiation doses to the European population have been negligible.

Simulations of the distribution of ^{137}Cs released after the Fukushima accident into the Pacific and Indian Oceans using an ocean general circulation model predict maximum ^{137}Cs concentrations in surface waters around 23 Bq/m^3 in 2012 in the open NW Pacific Ocean (at 38°N , 164°E), which will be comparable to that observed during the early 1960's after atmospheric nuclear weapons tests. Waters with maximum ^{137}Cs levels around 3 Bq/m^3 will reach the Hawaii islands in 2014. The ^{137}Cs levels (around 1 Bq/m^3) at the western US coast will be at maximum in 2016-2017. All the north Pacific and Indian Oceans will be covered with Fukushima ^{137}Cs 30 years after the accident with concentrations below 0.1 Bq/m^3 , i.e. undetectable on the present ^{137}Cs background. The total internal radiation dose from the intake of marine products from the open NW Pacific ocean was estimated to be around $2 \mu\text{Sv/a}$, which was mostly delivered by $^{134,137}\text{Cs}$. The doses for the population of the Hawaii islands will be by a factor of ten lower. The expected doses will be at least by two orders of magnitude lower than the present dose limit for the public.

Datum in čas:
Četrtek, 1. 9. 2011 ob 13. uri

Predavanje bo v veliki predavalnici IJS, Jamova 39, 1000 Ljubljana

Vljudno vabljeni