Book of abstracts

ENVIRA 2017

4th International Conference on Environmental Radioactivity: Radionuclides as Tracers of Environmental Processes

29 May – 2 June 2017 Vilnius, Lithuania

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Welcome to the ENVIRA2017 Conference

Dear Colleagues,

We welcome you to the ENVIRA2017, the International Conference on Environmental Radioactivity organized by the Centre for Physical Sciences and Technology (Institute of Physics) in Vilnius, Lithuania from Monday, May 29 to Friday, June 2, 2017. The venue and the Conference topics of the ENVIRA2017 which will be focusing on "Radionuclides as Tracers of Environmental Processes" were agreed on by the International Advisory Committee and confirmed at the closing session of the ENVIRA2015 conference held in Thessaloniki (Greece) in September 2015.

Following traditions of previous ENVIRA conferences, the ENVIRA2017 will consist of invited talks on relevant environmental radioactivity and radioanalytical topics, given by prominent representatives of the field, as well as by oral and poster contributions on various environmental radioactivity aspects. The conference will highlight the new scientific knowledge on the application of natural and anthropogenic radionuclides and isotopes in tracer studies in the terrestrial (atmosphere, hydrosphere, biosphere, pedosphere, etc.) and marine (seawater, marine biota, sediments, etc.) environments. The latest technological innovations in low-level radioactivity detection techniques including radiometric and low-energy and high-energy mass spectrometry methods, in situ measuring techniques, continuous monitoring systems, and other recent analytical developments will be included in the conference program as well. Radioecological topics, protection of the total environment against radiation including Chernobyl and Fukushima impacts on the environment, waste management and remediation actions on contaminated territories will be also covered.

Additionally, conference attendees and accompanying guests are invited to participate in our events: welcome reception, gala dinner, trip to Trakai.

If you have questions during the event, ENVIRA2017 committee staff will be available to assist you or you can contact envira2017@ftmc.lt and visit http://envira2017.ftmc.lt/ at any time.

Thank you for attending ENVIRA2017 and please enjoy the conference!

REMdb as a framework for collaborations in environmental radioactivity research

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Radioactivity Environmental Monitoring database (REMdb)

Under the terms of Article 36 of the Euratom Treaty, European Union Member States (MSs) shall periodically communicate to the European Commission (EC) information on environmental radioactivity levels. These results have been introduced into the Radioactivity Environmental Monitoring database (REMdb) of the EC Joint Research Centre (JRC) sited in Ispra (Italy) (https://rem.jrc.ec.europa.eu/RemWeb/).

The initial purpose of the REMdb was to bring together environmental radioactivity data produced in the aftermath of the Chernobyl accident, and to store them in a harmonised manner. Thus the database has two main objectives: 1) to collect the environmental radioactivity data gathered through the national environmental monitoring programs of the MSs to prepare comprehensive annual monitoring reports; and 2) to keep a historical record of the radiological accidents for scientific studies.

Nowadays, containing nearly two million records of radioactivity levels in milk, water, air and mixed diet received from the MSs, the REMdb offers the scientific community dealing with environmental radioactivity endless research opportunities.

The records stored in REMdb prior to 2007 are fully public, while the access to the data from the 2007-2015 period can be granted only after explicit request. This fact makes the REMdb a useful and unique pillar on which to perform environmental radioactivity studies at the European level, and which can be considered as a liaison platform between national and international scientific groups conducting collaborative research.

Example of collaboration: Analysis of ^{7}Be surface concentrations

As a valuable proof of this use, the present work provides an overview of the research activity undertaken by a friendly scientific collaboration network created by the University of Belgrade, the University of Bologna and the REM group of the JRC in the study of the ^{7}Be surface concentrations recorded across Europe. These sets of results represent one of the first attempts to better understand the ^{7}Be distribution in Europe, as well as the impact of tropopause height (TPH) and other meteorological parameters exert on it.

First, spatial and temporal distribution of the ^{7}Be specific activity in surface air was carried out using the long-term database (1984–2011) of 34 sampling sites, focusing on describing the impact of the latitude and solar cycle on yearly and monthly concentrations (Hernández-Ceballos et al., 2015). Further, a cluster analysis was instead applied to identify spatial patterns in ^{7}Be concentrations in Europe: results showed the presence of three distinguishable cluster groups (south, central and north of Europe) with clear differences between concentrations in both intensity and time trends, and with a latitudinal distribution of the sampling stations (Hernández-Ceballos et al., 2016a). These regions were also identified in an analysis of seasonal and spatial patterns of extremely high ^{7}Be surface concentration (values above 95th percentile in each site) recorded over the 2001–2010 period across Europe (Ajtić et al., 2016a). This study reported that most of the extremes occur over the March–August period, while at least 10 % of the total number of extremes take place during autumn and winter. In Ajtić et al., 2016b these "cold extremes" were analysed in more detail, showing three meteorological scenarios associated with their occurrence in northern Europe. In these works, the impact of TPH on ^{7}Be, and therefore, on the spatial distribution of ^{7}Be in Europe, was also suggested. The influence of TPH on ^{7}Be was further investigated in a separate study (Hernández-Ceballos et al., 2016b), which showed a larger TPH influence on ^{7}Be during summer and a large spatial variability of TPH on ^{7}Be levels with a clear gap between southern and northern Europe in the area of the polar front jet.

Ajtić et al., 2016a. Beryllium-7 surface concentrations extremes in Europe. Submitted to Facta Universitatis.
Ajtić et al., 2016b. Analysis of extreme beryllium-7 specific activities in surface air. Rad. Applic. 1, 216-221.
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