



WeBIOPATR 2021

The Eighth International WEBIOPATR
Workshop & Conference
Particulate Matter: Research and Management

Abstracts of Keynote Invited Lectures and Contributed Papers

Milena Jovašević-Stojanović,
Alena Bartoňová,
Miloš Davidović and Simon Smith, Eds

Vinča Institute of Nuclear Sciences
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**ABSTRACTS OF KEYNOTE INVITED LECTURES AND
CONTRIBUTED PAPERS**

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Editors

Milena Jovašević-Stojanović

Alena Bartoňová

Miloš Davidović

Simon Smith

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4.3 HEALTH RISK ASSESSMENT OF PARTICULATE MATTER EMISSIONS FROM NATURAL GAS AND FUEL OIL HEATING PLANTS USING DISPERSION MODELLING

Ž. Ćirović (1), M. Ćujić (2), M. Radenković (2), A. Onjia (3)

(1) Innovation Center of the Faculty of Technology and Metallurgy, Karnegijeva 4, 11120 Belgrade, Serbia
(2) Vinča Institute of Nuclear Sciences, Mike Petrovica Alasa 12-14 11001 Belgrade, Serbia. (3) Faculty of Technology and Metallurgy, University of Belgrade, Karnegijeva 4, 11120 Belgrade, Serbia
zcirovic@tmf.bg.ac.rs; cujicm@vin.bg.ac.rs; mirar@vin.bg.ac.rs; onjia@tmf.bg.ac.rs

A significant proportion of homes and apartments in Serbia are still reliant on central heating systems during winter months, with about fifty heating plants in operation. Common fuels used in these plants primarily include fossil fuels such as coal, fuel oil, and natural gas. Some of these fuels have a high sulfur content, leading to an increased concentration of sulfur dioxide and particulate matter in the atmosphere (Todorović et al, 2020; Todorović et al, 2021). This study compares and evaluates the environmental impact of the two heating boilers at the Valjevo city (Serbia) heating plant. The AERMOD air dispersion model was used for estimating the concentrations of the various pollutants (Kakosimos et al, 2011; Mokhtar et al, 2014; Shaikh et al, 2020). Onsite emission data were gathered separately for the two heating boilers at the facility fuelled by natural gas and fuel oil, respectively. A combination of topographical and historical meteorological data were used to set up a receptor grid that was exposed to the gas emission in a radius of 10 km. The environmental impact from the fuel oil boiler was shown to be significantly higher than that caused by the natural gas-fuelled boiler. The resulting distribution of pollutant gases and particles showed that the concentration gradient is less inclined towards the city centre and instead spreads eastwards into the surrounding villages. The data were used to evaluate carcinogenic and non-carcinogenic health risks. It was found that the health risk was acceptable for different averaging periods. However, further study is still required in order to properly assess the cumulative health risk generated by other surrounding industries.

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