

An Introduction to the Special Issue on Recent Methods on Physical Polluting Agents and Environment Modeling and Simulation

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This special issue focus on new methods in controlling different polluting elements such as chemical pollutants, acoustical noise and natural radioactivity. In particular, in this issue the reader may find research papers on the following different topics.

Chemical pollutants, in particular volatile organic compounds, are presented in the paper of Julia Griselda Ceron Breton, et al.. A large field measurements campaign has been pursued in the area of Monterrey, Mexico, and the correlation between different collected data has been analyzed. In particular, a relation among criteria pollutants, meteorological parameters and aromatic hydrocarbons has been found using a Principal Compound Analysis, identifying some associations among the pollutants originated in common sources. Air pollutants maximum concentrations were found when winds blow from North-East, where important industrial sources and avenues with high vehicular traffic are located. In addition, the data did not show a clear pattern of volatile organic compounds/NO_x sensitiveness to ozone formation during the study period.

The paper of Ahmad Fadzil, et al. presents an experimental approach to air pollution study, based on field measurements taken in Selangor, Malaysia, in 2012. The comparison with simulations results, using the Operational Street Pollution Model, showed good agreement thus indicating suitability of the model to be used in Malaysia condition. Air quality trends for the criteria pollutants in this month are studied, in comparison with the levels of the Malaysian Ambient Air Quality Guideline. The comprehensive review has revealed that moving vehicles creates a significant impact in air quality on the specific locations.

Regarding natural radioactivity, the reader will find two papers focusing on Radon concentration analysis. The first one, by Michele Guida et al., is related to water assessment and management. It

presents field measurement in the Bussento river basin, located in the south-east of Campania region, to be merged with hydrological modeling tasks. The aim of this work was to develop an useful methodology for the localization of the contributions to Radon concentrations of the groundwater along the riverbed, and for their proportional assessment compared with the superficial back return flow.

The second paper on natural radioactivity, by Domenico Guida et al., presents an interdisciplinary research program with contributions from Geology, Geomorphology, Soil Science, Environmental Physics, Building Engineering and Radiology and Epidemiology, aimed to the development of a standard methodology, based on a multi-scale hierarchical (regional - provincial - sector- zone site) procedure of assessment of the Radon exhalation from soils. The approach described in this paper, implemented in a GIS framework, turns out to be a very powerful tool in many environmental and territorial planning approaches, especially wherever a "vast area" approach is needed to the environmental issues, i.e., the case of the urban acoustical or the electromagnetic pollution zoning.

Finally, the environmental impact due to road traffic noise is presented in the last paper. In particular, Claudio Guarnaccia presents a set of advanced tools for noise modeling, particularly aimed at the prediction of non-conventional situations, such as road intersections, traffic jams, extreme traffic flow, etc., where the standard Traffic Noise Models usually fail. The main idea is to implement a dynamical approach in the traffic noise prediction, i.e. to include the dependence of noise emission by kinematical parameters, such as speed, position and eventually acceleration. This can be achieved by means of different approaches, some of them resumed in the paper, for instance cellular automata, traffic theory (Fundamental Diagram),

source power dependence from the speed, etc.. The implementation of these models in easy to use tools represents the new horizon in traffic noise prediction

Finally, as editors of this Special Issue, we would like to express our praise to all the authors, reviewers and journal staff. The contribution of each of them was essential to the making of a very interesting and useful, in our humble opinion, collection of research papers.