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IT for air quality management - mathematical modeling verified by special sampling and nuclear analytical methods and Air Pollution Management System (AQMS)

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AQMS - in this case, the broad name includes in particular measurement and mathematical modeling of air pollution, geoinformation technologies for the analysis of their results and preparation and implementation of modeling on parallel supercomputer clusters. In the past few years, my team and I have been researching and refining mathematical models, expanding the amount of processed input data using the most powerful supercomputers available, verifying model calculations using special monitoring using nuclear analytical methods - NAA of bryophytes, unmanned aerial vehicle and robotic automatic sampler placed on a former mining tower filters in the area of interest. We created a model of air pollution relations in a large area between the Czech Republic, Poland and Slovakia, which we called Tritia. We have created a Air Quality Management System for this area, which uses the results of retrospective and perspective modeling over a large period of time (from 2006 to 2040). Researchers from the abovementioned countries and the JINR participated in all these works. We would like to continue this cooperation and further develop our research in all these areas. We would like to transfer our results to the JINR environment. That is neutron activation analysis (NAA) of filters and bryophytes. Furthermore, we would like to focus on the transfer of mathematical models and IS and their new variants (improvements and refinements) to the platforms used in the JINR.

Summary

AQMS is mathematical modeling of air pollution, geoinformation technologies and implementation of modeling on parallel supercomputer clusters. We verified model calculations using special monitoring using nuclear analytical methods - NAA of bryophytes, unmanned aerial vehicle and robotic automatic filter sampler placed on a former mining tower filters. We would like to transfer all our results to the JINR environment and continue of this research.

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