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and
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DEVELOPMENT OF REAL-TIME RESPONSE SYSTEM FOR AIR POLLUTION DISPERSION ACCIDENTS IN URBAN AREAS

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The paper is a result of initial research of NATO SfP GEPSUS project aimed at development of an integrated system for environmental pollution-related disasters management based on a fusion of Geographical and Atmospheric Information Processing, Computer Modelling and Simulation, and Credible Decision Making. It addresses the development of real-time response software platform for simulation and prediction of hazard scenarios associated with accidental releases of toxic gases in the urban areas.

The software system will be elaborated in term of both the embedded modules and feasible integration. The modules for air dispersion modelling, real-time input and output data handling, geospatial based visualisation and emergency management will be described from the technical aspects as well as the aspects of the critical user requirements like chemical information, atmospheric conditions, terrain characteristics, source type, toxic level of concern, optimal countermeasures etc.

After analysing of similar systems worldwide it will be shown that our approach differs in the following: computing speed that allows real-time operation, taking in consideration micro climate and terrain, allowing the possibility of the existence of multiple accident sources, providing 3D visualisation and web oriented accesses even with personal communication devices and employing artificial intelligence to support decision making. As such, it is expected to be accurate and suitable for wide range of users.

The end users of the system will be Ministry of Defence of Montenegro, Sector for emergency management, fire brigades, urban planners, factories as well as other institution responsible for environmental and civil protection. Based on the simulation and prediction results the consequences of the air-pollution accident will be estimated and proper rescue actions determined.

In addition to the above, the several examples of real scenario from our case study sources Aluminium Factory and Thermo Power Electric Plant will be presented. At the end, the vision of future work on the GEPSUS will be outlined.