



## **Development of the re-engineered European decision support system for off-site nuclear and radiological emergencies - JRODOS. Application to air pollution transport modelling**

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The European decision support system for nuclear and radiological emergencies RODOS includes a set of numerical models simulating the transport of radionuclides in the environment, estimating potential doses to the public and simulating and evaluating the efficiency of countermeasures. The re-engineering of the RODOS system using the Java technology has started recently which will allow to apply the new system called JRODOS on nearly any computational platform running Java virtual machine.

Modern software development approaches were used for the JRODOS system architecture and implementation: distributed system design (client, management server, computational server), geo-database utilization, plug-in model structure and OpenMI-like compatibility to support seamless model inter-connection.

Stable open source components such as an ORM solution (Hibernate), an OpenGIS component (Geotools) and a charting/reporting component (JFree, Pentaho) were utilized to optimise the development effort and allow a fast completion of the project.

The architecture of the system is presented and illustrated for the atmospheric dispersion module ALSMC (Atmospheric Local Scale Model Chain) performing calculations of atmospheric pollution transport and the corresponding acute doses and dose rates. The example application is based on a synthetic scenario of a release from a

nuclear power plant located in Europe.