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Combination of RanidSONNI Mobile Laboratory Devices and Rodos DSS computer Technologies to Forecast Consequences of Fires in the ChNPP Exclusion Zone

*This study focuses on joint application of the RanidSONNI mobile laboratory
hardware and RODOS DSS computer technologies using the example of numerical
forecast of radiation consequences for Kyiv residents caused by radioactive cloud
under the city resulting from a wildfire in the Chernobyl Exclusion Zone that occurred
on 5 June 2018 in Red Forest area.*

*The purpose of the study was, on the one hand, to combine rapid response
technologies using mobile environment sampling tools and computer technologies for
forecasting the spread of air contamination at long distances based on weather
forecast data, and on the other hand, to define true extent of radiation impact of the
radiation cloud on Kyiv residents, which according to the meteorological situation had
to pass over the city at the moment of wildfire.*

*The interest in the issue raised is preconditioned by difficulties arising when it
is necessary to measure short-term air contamination: in many cases it is possible to
obtain actual air contamination indices at a long distance from source term location
under its short-term impact only in the center of the cloud itself, which is spread from
the source term in wind direction. This preconditions a random nature of
contamination registering, if registering is done using stationary control posts. As
previous studies have shown, the probability that the cloud formed by the source term
passes just above the sampling site is low enough.*

*The article presents a general description of implementing the joint operation of
computer technologies for numerical forecast for radioactive cloud spread in the
environment using RODOS DSS software package and the air monitoring hardware
installed on the RanidSONNI mobile laboratory for radiation survey. The article shows*

specific hardware for sampling and measuring Cs-137 concentrations in the air is shown, presents the results of forecasting radioactive release spread for long distances and the results of assessing exposure doses for Kyiv residents for the whole time of radioactive cloud passage over the city.

Keywords: wildfire, RODOS DSS, RANIDSONNI mobile laboratory, environment radiation monitoring.