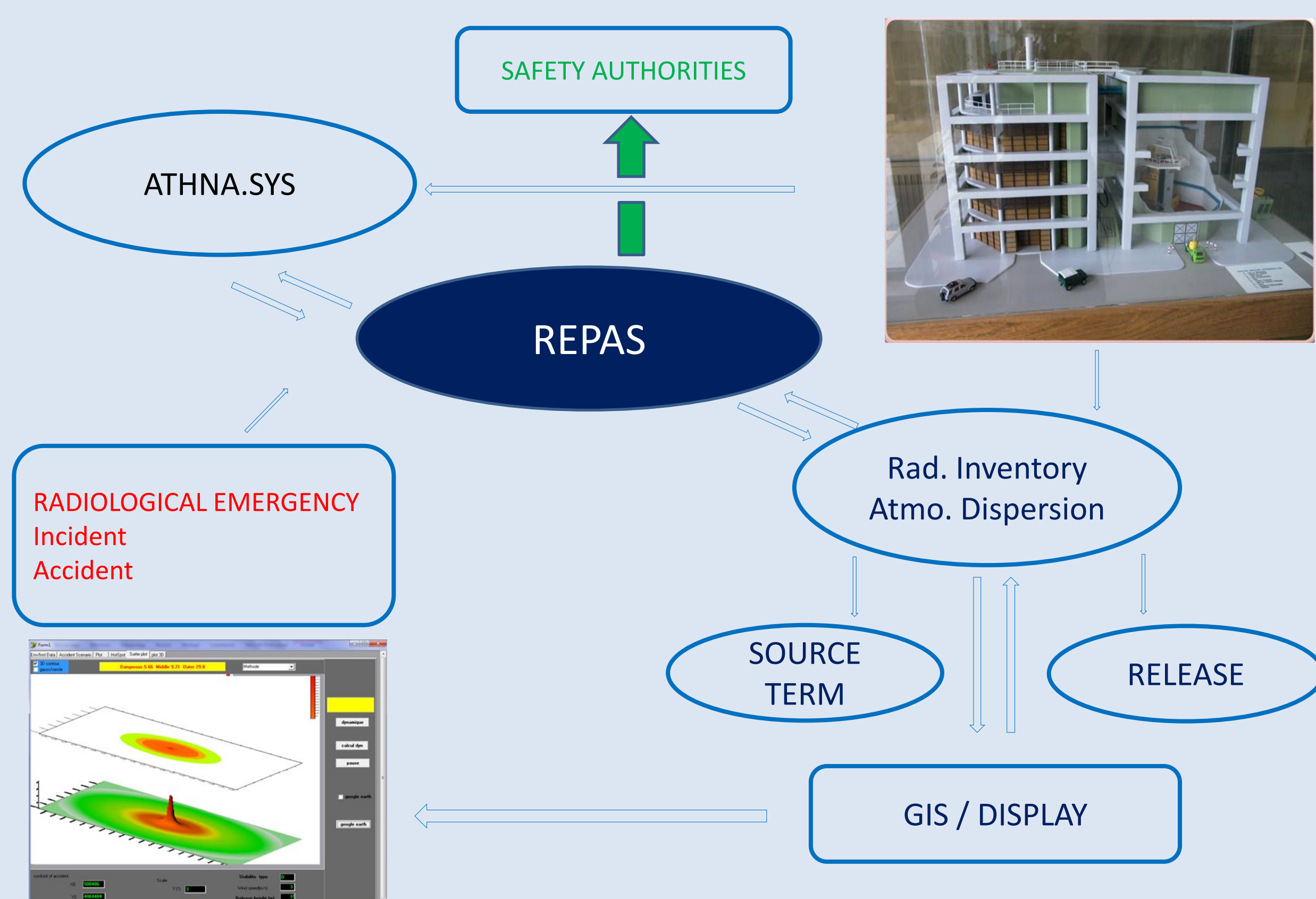


## Development of a platform for the evaluation of the source term and the atmospheric dispersion of a nuclear facility in a radiological emergency event

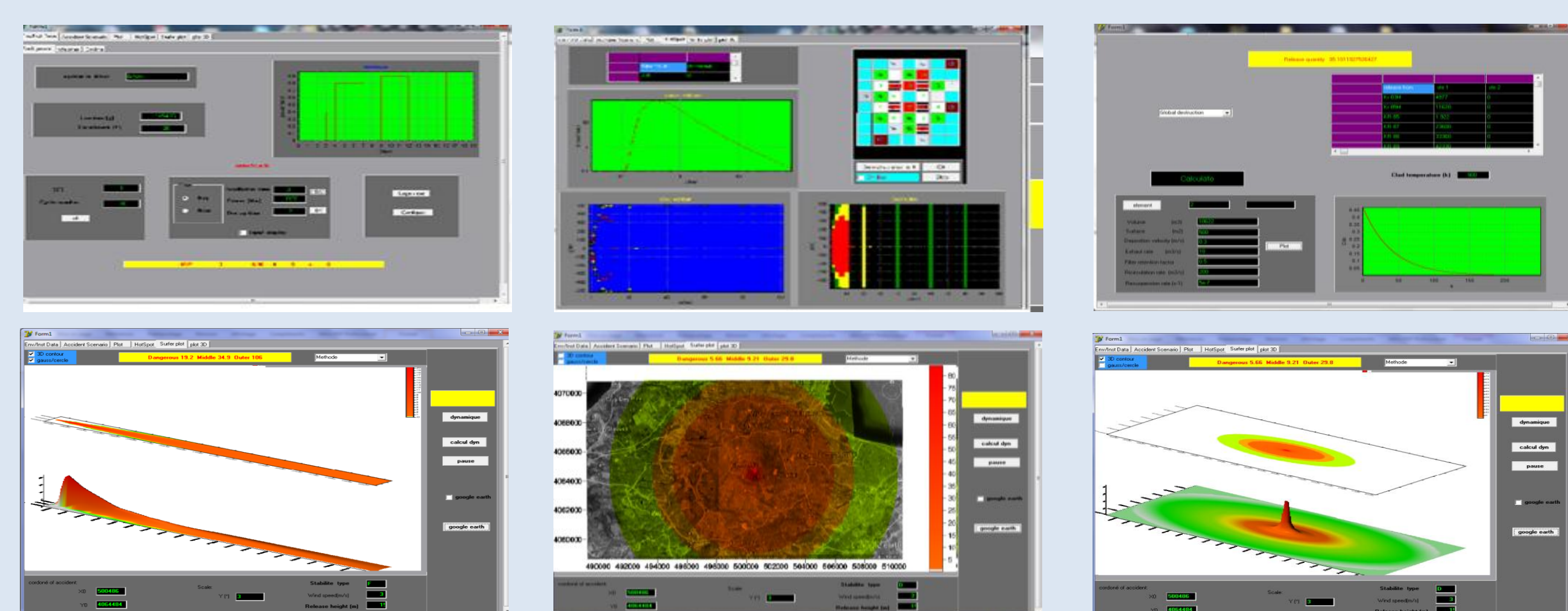
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As part of the implementation of the national emergency preparedness and intervention in nuclear accidents, the Algerian Commission of Atomic Energy (COMENA) is developing a Radiological Emergency Preparedness Advisory System (REPAS). The system would be used to monitor the operation of its nuclear facilities and to analyze abnormal events to continuously improve the safety systems and to develop and implement various emergency crisis plans. To take rapid and efficient corrective measures, decision makers require a swift estimate of the radiological conditions around the facility. To this end, specific tools are needed to evaluate the source term and the dispersion of radioactive products released in the environment to estimate the impact on the public and the environment in terms of radioactive exposures and radioactive deposits.



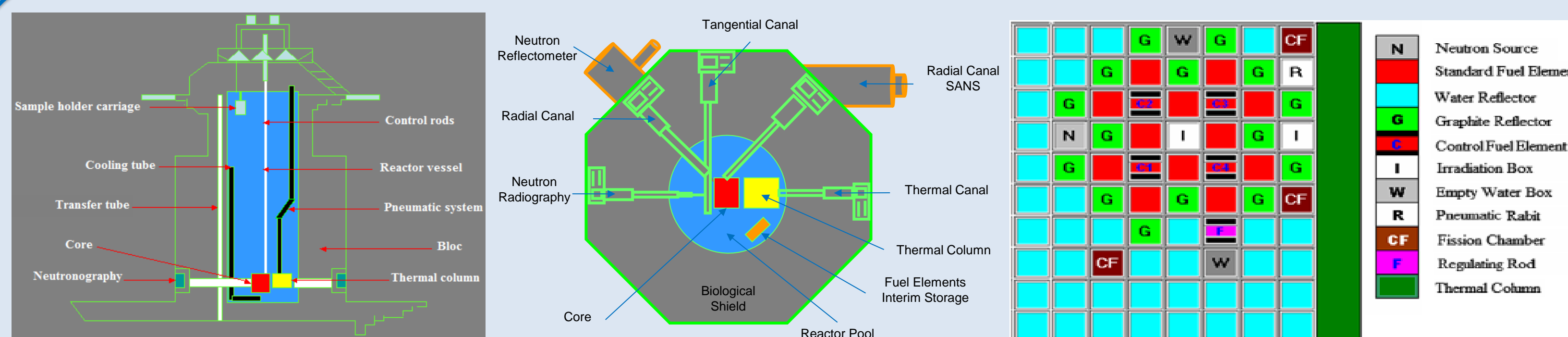
A PC-based platform for the simulation and analysis of nuclear accidents in MTR type research reactors was developed. The platform allows a rapid determination of the radioactive source term and the atmospheric dispersion of radioactive products around the facility in the event of a reactor accident, taking into account pertinent parameters such as: reactor operating parameters, containment characteristics, meteorological parameters, etc...

### Main Graphical Interfaces

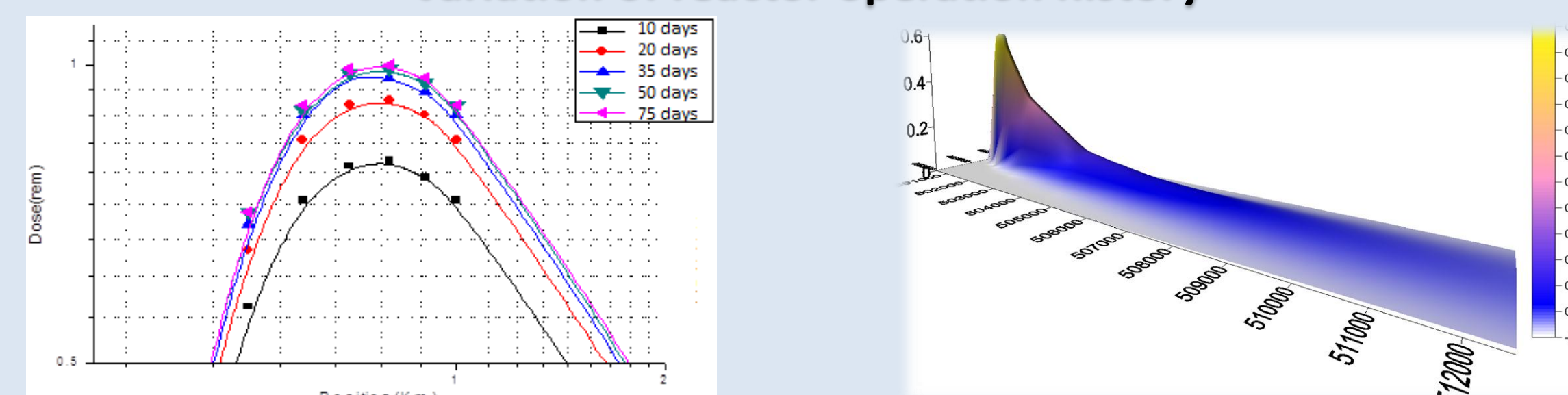


### Sample results of accident scenarios simulated for the case of the NUR research reactor according to the characteristic parameters of the facility and meteorological conditions specified in the table

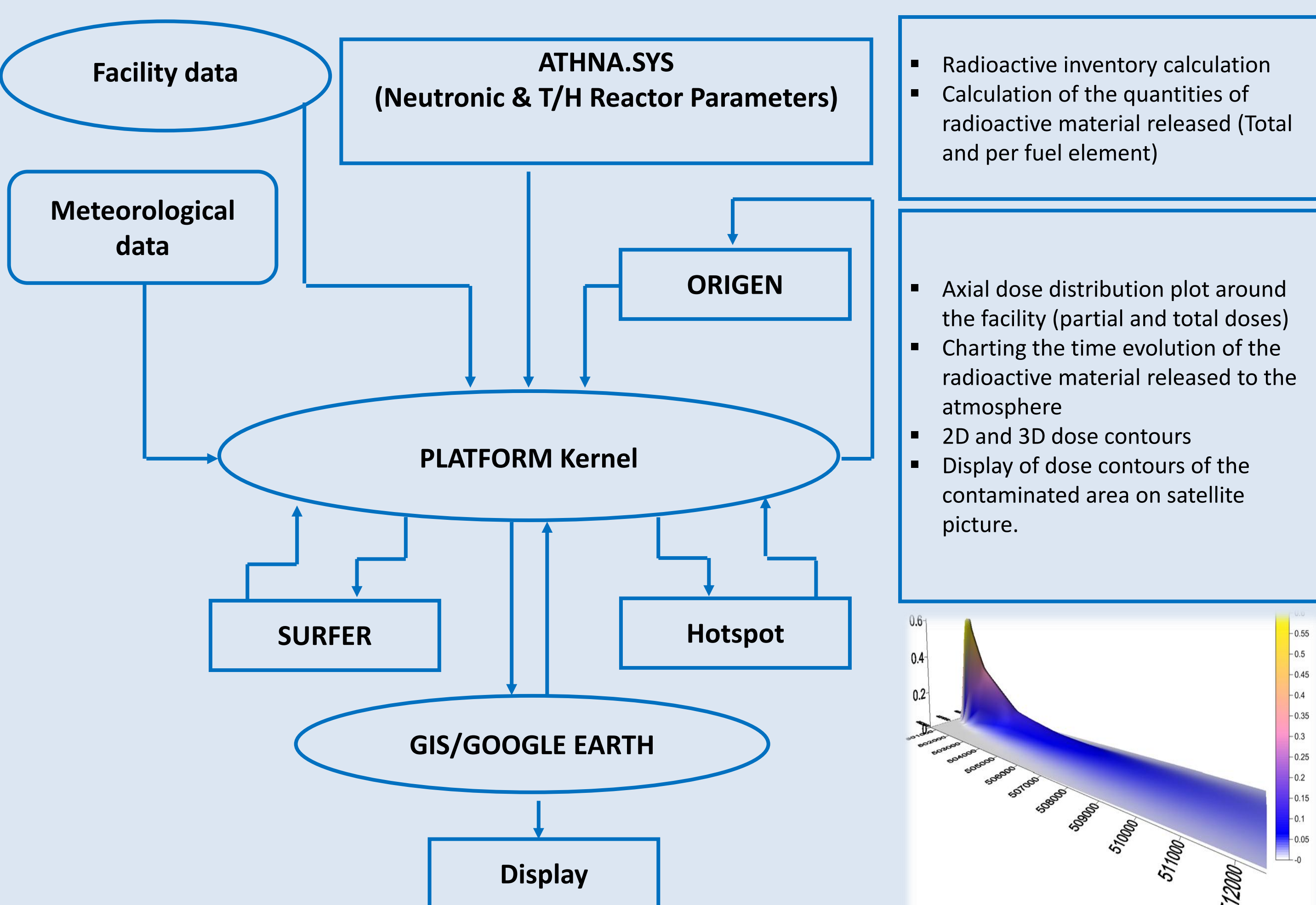
Fuel quantity (g)	Fuel enrichment (% U235)	leakage rate from the confinement (m <sup>3</sup> /s)	free surface area (m <sup>2</sup> )/confinement volume (m <sup>3</sup> )	Filter retention factor	Wind speed (m/s) Stability	Plume Height (m)
22500	20	10	S=105 V=1062	0.5	v=3 F	15



### Variation of reactor operation history



The platform combines neutronic and thermal hydraulic calculations, using the ATHNA.Sys Analyser system, radioactive inventory estimation by the ORIGEN code and environment radioactive releases dispersion calculations by HOTSPOT code. GIS/Google Earth and SURFER10 are used to determine the geographical positions.



### Variation of atmospheric conditions

