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Radiological study of the nuclear facility S3 of SPIRAL2

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The modeling of a nuclear facility is a necessary tool to define the radiological environment and to draw the rays map. This quantification is an important phase in the conception of a facility. It allows to know how the facility respects the safety constraints as well as the general operating for what it is authorized. This work presents S3 as an example of the modeled nuclear facility. S3 (Super Separator Spectrometer) is a device of SPIRAL2 dedicated to the experiments with high intensity stable beams to study heavy and super heavy nuclei, especially the neutron deficient ones. Light nuclei, namely those produced by transfer reaction, will also be available in S3. In this work we present the modeling of the current S3 facility, the simulation results of particles transport and the rays map (neutrons and other light particles) in S3 building. Some consequences of these calculations as the damage for electronic components or for cryogenic liquids will also be presented. These studies used a Monte Carlo calculation method, namely with the Japanese code PHITS2.82.

Keywords : Modeling, Monte Carlo simulation, Particles transport, Neutron doses

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