

Nuclear Medicine research environments: from EGI production to EOSC services

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Inserm is the first biomedical research institute in Europe in terms of publications.

Inserm contribution to the EOSC architecture for Life and medical science is therefore essential, first to fully cover the field and second to make sure that EOSC service offer corresponds to identified needs of the community. INSERM's contribution to the service catalogue is expressed through several INFRAEOSC call answers (at different levels of participation, WPs, tasks, development, dissemination): **EOSC-Life** for INFRAEOSC-04 (clusters), **EOSC-Pillar** for INFRAEOSC-05b (National services) and our current proposal, **BOSSEE** for INFRAEOSC-02 (new innovative services). At Inserm, we coordinate our participation to these cross initiatives by providing well-tooled case studies led by very active communities, such as the one described here.

The **OpenDose** collaboration was established to generate an open and traceable reference database of dosimetric data for nuclear medicine. Producing data using a variety of Monte Carlo codes and analyzing results represents a massive challenge in terms of resources and services.

The amount of data to generate requires running tens of thousands of simulations per dosimetric model, for a total computation time estimated to millions of CPU hours. The **EGI Infrastructure** was quickly identified as the best solution to run those simulations, because of the embarrassingly parallel nature of the computation and the availability of existing tools and workflows to run Gate on the grid.

The first part of the presentation will focus on the data production process using GATE on the EGI Infrastructure. We will describe solutions developed by CRCT, Inserm CISI and CREATIS using existing tools such as **VIP** and **GateLab**. we will also present first production results and insights with regards to execution times and submission strategies.

The second part of the presentation will present ongoing work on data analysis aspects. Once in the database, raw data has to be processed into dosimetric data in a robust and reproducible way. In this aim, CRCT will build on the Jupyter ecosystem to create a unified data analysis framework for the OpenDose project. CRCT is leading a task within the BOSSEE proposition, for which EGI.eu is also a partner. The deliverable of this task will be a demonstrator available via the **EOSC hub**, contributing to the development of innovative services for the scientific community. Together with a global overview of the BOSSEE proposal, we will describe technical aspects of our work in this context, and show how this will foster user engagement and facilitate support throughout the community with the development of EOSC services.

¹ BOSSEE: *Building Open Science Services on European E-infrastructure* (call INFRAEOSC-02-2019, topic: Prototyping innovative services)

² M. Chauvin et al. "OpenDose: A collaborative effort to produce reference dosimetric data with Monte Carlo simulation software". In: *Physica Medica* 42 (Oct. 2017), pp. 32–33. DOI: 10.1016/j.ejmp.2017.09.081.

Type of abstract

Presentation

References

M. Chauvin et al. "OpenDose: A collaborative effort to produce reference dosimetric data with Monte Carlo simulation software". In: *Physica Medica* 42 (Oct. 2017), pp. 32–33. DOI: 10.1016/j.ejmp.2017.09.081.

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