

# 11th International Meeting of the Union for Compact Accelerator-driven Neutron Sources (UCANS11)

Contribution ID: 55

Type: **Invited Talk (Category for invited speakers only)**

## Update on Thermal Scattering Kernel Generation at the European Spallation Source

*Monday, 24 February 2025 16:00 (40 minutes)*

The Spallation Physics Group at the European Spallation Source (ESS) conducts radiation transport simulations to support the facility's design and licensing processes. These simulations integrate geometric system representations with nuclear data to analyze radiation interactions and produce observables such as dose maps and detector responses. Our work has led to the development of advanced scattering kernels for various materials, including liquid hydrogen, liquid and solid deuterium, superfluid helium and diamond nanoparticles, particularly in the context of the HighNESS project. Moving away from legacy tools like GASKET and NJOY, the team now emphasizes the use of open-source tools, such as NCrystal, to generate high-precision nuclear data for neutron sources and instruments. This approach combines molecular modeling techniques, novel data formats, and Monte Carlo code modifications to enhance simulation capabilities. These advancements, developed in close collaboration with the ESS Data Management Center, contribute to the continuous evolution of neutron transport simulations and are shared with the broader scientific community through open-source platforms and nuclear data libraries.

Within this framework we will present the recent developments in cold neutron moderator scattering kernel generation, and contributions to the evaluated nuclear data libraries. In particular, we will present the case of solid methane for which we re-implemented the Granada model using new experimental data and enhanced it by introducing spin correlation effects and improved angular distributions.

### Email Address

### Presenter if not the submitter of this abstract

### Funding Agency

### Abstract classification - track type

Cold Moderators and Beyond

**Primary authors:** MÁRQUEZ DAMIÁN, José Ignacio (European Spallation Source ERIC); DI JULIO, Douglas (European Spallation Source ERIC); Dr KITTELMANN, Thomas (European Spallation Source ERIC); Dr XU, Shuqi (European Spallation Source ERIC); Dr MUHRER, Günter (European Spallation Source ERIC)

**Presenter:** MÁRQUEZ DAMIÁN, José Ignacio (European Spallation Source ERIC)

**Session Classification:** Session 2