Contribution ID: **15** Type: **Poster**

QRPA predictions of the E1 and M1 gamma-ray strength functions using the D1M Gogny interaction

Within the framework of a global microscopic approach, all the nuclear input required for nuclear reaction predictions are being, step by step, derived from a sole nucleon-nucleon effective interaction, namely the D1M Gogny force [1]. Nuclear masses [1], deformations, radial densities and level densities [2] have already been obtained and have shown a rather good agreement with experimental data either directly or when used, for instance, to derive optical models [3]. We now focus on the radiative strength functions within the QRPA approach [4], and in particular, aim at producing tables of gamma-ray strength functions for both E1 and M1 transitions. The current status of this project will be discussed with a particular emphasis on the consequences on capture cross section modelling.

[1] S. Goriely et al., First Gogny-Hartree-Fock-Bogoliubov Nuclear Mass Model, Phys. Rev. Lett 102, (2009) 242501.
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[3] S. Hilaire et al., Nuclear reaction inputs based on effective interactions, Eur. Phys. J. A 52 (2016) 336.
[4] S. Péru et al., Giant resonances in 238U within the quasiparticle random-phase approximation with the Gogny force, Phys. Rev. C 83 (2011) 014314.

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Track Classification: Track B