



Contribution ID: 19

Type: **Contributed talk**

ELI Silicon Strip Array (ELISSA) at ELI-NP

Wednesday 18 September 2024 10:35 (15 minutes)

ELISSA is a 4π silicon strip detector array implemented at the ELI-NP facility for measurements of photodissociation reactions using high-brilliance, quasi-monoenergetic gamma beams. The array consists of three rings of 35 single-sided X3 detectors and two end-caps made up of eight double-sided QQQ3 detectors. However, multiple configurations are possible with the YY1, MMM, and QQQ3 detectors as end-caps detectors. Recently, new direct measurements of the $^{19}\text{F}(p, \alpha)^{16}\text{O}$, $^7\text{Li}(p, \alpha)^4\text{He}$, and $^6\text{Li}(p, \alpha)^3\text{He}$ reactions at astrophysical energies were successfully carried out with the scaled-down version of the ELISSA detector array at the IFIN-HH 3\,MV Tandem. The mini-ELISSA chamber and CH_2 targets were used for these measurements.

Presently, ELISSA needs to upgrade to a larger chamber as mini-ELISSA has limitations in using available detector configurations. In this regard, the Monte Carlo simulation has been carried out with multiple configurations using the YY1, MMM, QQQ3, and X3 detectors both for gamma beam and ion beams. For example, a simulation of $^7\text{Li}(\gamma, t)^4\text{He}$ reaction with the MMM and YY1 Silicon Detectors was completed and the $^7\text{Li}(\gamma, t)^4\text{He}$ experiment was also successfully carried out at HIGS using the YY1 detectors.

In this talk, detailed activity using the ELISSA array at ELI-NP will be presented.

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Session Classification: Plenary Session