



ID de Contribution: 75

Type: Non spécifié

## Report on the AGATA experiment number 22.18

*vendredi 13 septembre 2024 10:15 (15 minutes)*

The experiment 22.18 was performed to study the nucleus  $^{96}\text{Zr}$  utilising the  $\gamma$ -ray tracking spectrometer AGATA coupled with the heavy-ion detector array SPIDER at INFN-LNL. This experiment is extremely timely in order to provide directly the  $3_1^- \rightarrow 0_1^+$   $\gamma$ -ray transition probability for the first time. Previous measurements suggested that the  $\gamma$ -ray transition probability for the first  $3^-$  state is one of the largest across the nuclear chart. This observation has never been reproduced by any theoretical calculations, and it is puzzling as it does not correspond to a similar increase in the neighbour isotopic chains. A recent study, instead, provides a significantly reduced  $\gamma$ -ray transition probability for the  $3_1^- \rightarrow 0_1^+$  transition, which is in better agreement with state-of-the-art shell-model calculations. Nevertheless, up to now the experimental values were obtained only via indirect methods. In this talk, we will present the preliminary results on the decay of this state to the ground state. The obtained  $B(E3)$  value seems to confirm how this quantity is not as large as previously thought, supporting the idea that it does not represent an outstanding value in the nuclide chart.

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**Classification de Session:** ACC