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Octupole Collectivity in ^{96}Zr from Low-Energy Coulomb Excitation with the AGATA+SPIDER Setup

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An experiment was performed to investigate the octupole collectivity in the ^{96}Zr isotope, for which the structure of the first 3^- state has been widely debated in the literature. Previous measurements suggested that the γ-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 γ-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. We performed a dedicated Coulomb-excitation study of the nucleus ^{96}Zr utilising the γ-ray tracking spectrometer AGATA coupled with the heavy-ion detector array SPIDER at INFN-LNL. This investigation is extremely timely in order to provide directly the $3_1^- \rightarrow 0_1^+$ γ-ray transition probability for the first time. 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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