



Nuclear-spectroscopy performance of ANSWERS@TASCA

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A novel experimental technique for nuclear spectroscopy (alpha, electron, photon) [1], named ANSWERS (Adsorption-based Nuclear Spectroscopy Without Evaporation Residue Signal), was built in 2020 at the SHE Chemistry department, GSI, and is currently in successful operation.

The results of the first commissioning experiments, in which alpha-decay fine structures of ^{211}Bi and ^{253}No were studied, showed the great potential of ANSWERS for measuring multi-coincident events with high efficiency.

Large-sized experimental data taken with ANSWERS, where all signals are processed by the fast digital electronics, have required significant developments in the data-evaluation and data-interpretation process. These developments, including the implementation of GEANT4 simulations, are being undertaken together with further upgrades of ANSWERS.

In this talk, results of the GEANT4 simulations for the ANSWERS-detectors' responses in cases of alpha decay fine structures of ^{211}Bi and ^{253}No will be presented and compared with the experimental data. In addition, recent results from the $^{48}\text{Ca} + ^{209}\text{Bi}$ reaction will be presented.

We are grateful for GSI's the Experimental Electronics department and Target Lab for their continuous support of the experimental program at TASCA. We acknowledge the ion-source and UNILAC staff for providing the stable and high intensity ^{48}Ca beam. The results are based on the experiment U308, which was performed at the beam line X8/TASCA at the GSI Helmholtzzentrum für Schwerionenforschung, Darmstadt (Germany) in the frame of FAIR Phase-0.

References

- [1] J. Khuyagbaatar, A. Yakushev, et al., to be published.