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Recent results and perspectives using T-REX with MINIBALL

T-REX is a large acceptance silicon array which is coupled to MINIBALL at ISOLDE. Its main purpose it to measure angular distributions of emitted light particles after transfer reactions, allowing to quantify the shell model configurations of excited single particle states or collective excitations in exotic nuclei.

Recently, T-REX was re-designed to also allow for Coulomb-Excitation experiments. The large angular coverage allows for a precise determination of quadrupole moments and allows for a reliable determination of matrix elements after multistep coulomb excitation. We present latest results from our high-intensity 72Zn multiple Coulomb excitation experiment at ISOLDE, resulting e.g. in a precise value for the quadrupole moment of the first 2+ state as well as in matrix elements connecting several low-lying states. We also populated the 0+2 state in this nucleus, who’s collective properties may gain new insight into the complex shape coexistence phenomena around N=40.

Our collaboration is currently investigating a major upgrade of the T-REX array towards HIE-ISOLDE. Beside a substantial improvement of energy resolution, a combined setup for Coulomb Excitation experiments and direct nuclear reactions is under discussion. This also includes a new and uniform readout scheme for MINIBALL and auxiliary detectors. We give an overview of the current developments and challenges.

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