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Coulomb excitation of doubly-magic 132Sn at HIE-ISOLDE

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The vibrational first 2^+ and 3^- states of the doubly-magic nucleus ^{132}Sn were excited via safe Coulomb excitation (CE) employing the recently commissioned HIE-ISOLDE accelerator at CERN in conjunction with the highly efficient MINIBALL array. The ^{132}Sn ions were accelerated to an energy of 5.5 MeV/nucleon and impinged on a ^{206}Pb target. Dexciting γ rays from the first excited states of the target and the projectile nucleus were recorded in coincidence with scattered particles. The optimized beam energy, the high-energy resolution and good efficiency of the HPGe spectrometer provide a favourable combination to master the demanding measurement characterized by small CE cross sections of the high lying states with excitation energies above 4 MeV. The reduced transition strengths were determined for the transitions $0^+ \rightarrow 2_1^+$, $0^+ \rightarrow 3_1^-$, and $2_1^+ \rightarrow 3_1^-$ in ^{132}Sn. In the past first preliminary results for the $B(E2; 0^+ \rightarrow 2_1^+)$ value were obtained with an efficient BaF2 array at ORNL [1]. The results on excited collective states in ^{132}Sn provide crucial information on cross shell configurations that are expected to be dominated by a strong proton contribution. Large-scale shell model calculations and new mean field calculations are on its way.
[1] R.L. Varner, et al.; Eur. Phys. J. A 25, s01, 391 (2005)

Authors: Mr ROSIAK, Dawid (University of Cologne); REITER, Peter (University Cologne, Nuclear Physics Institut)

Co-authors: RAINOVSKI, Georgi Ivanov (University of Sofia (BG)); CEDERKALL, Joakim (Lund University (SE)); GAFFNEY, Liam (CERN); GARCIA BORGE, Maria Jose (CERN); SEIDLITZ, Michael (Universitaet zu Koeln (DE)); VAN DUPPEN, Piet (KU Leuven (BE)); KROELL, Thorsten (Technische Universitaet Darmstadt (DE))

Presenter: Mr ROSIAK, Dawid (University of Cologne)

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