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Couloumb excitation of ^{210}Pb

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Abstract

The nuclear shell model, combined with pairing correlations, provides a natural description of the low-energy structure of semi-magic nuclei. In nuclei with two valence particles outside a closed shell, low-lying excited states are formed by the angular momentum recoupling of unpaired nucleons within a single high-j orbital, forming multiplets characterized by the seniority quantum number ν. The generalized seniority scheme represents a truncated description of the nuclear shell model and provides an important framework for studying nuclei near shell closures [1].

The nucleus ^{210}Pb, consisting of two valence neutrons outside the doubly magic ^{208}Pb core, represents an ideal system for testing the validity of the se-

niority scheme. A safe Coulomb-excitation experiment was performed at HIE-ISOLDE using a post-accelerated ^{210}Pb beam impinging on a ^{120}Sn target, with the emitted γ rays detected by the MINIBALL detector array [2]. The aim of this study is to determine the low-lying electromagnetic transition strengths, in particular the $B(E2; 2_1^+ \rightarrow 0_1^+)$ and $B(E2; 4_1^+ \rightarrow 2_1^+)$ and compare them with shell-model predictions to test the description of nuclear structure near the $N = 126$ shell closure. Preliminary results from the analysis will be presented and compared to the shell model calculations.

References

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