DWIA PRODUCTION CROSS SECTIONS OF p-SHELL HYPERNUCLEI CALCULATED WITH PARITY-MIXED EXTENDED WAVE FUNCTIONS

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In order to get a comprehensive description of hypernuclear structure, we have introduced the multi-configuration wave functions in which we take account of the parity-mixing intershell coupling mediated by a Lambda-hyperon. Recent (e,e'K+) reaction experiments done at the Jefferson Lab have provided us with remarkably high resolution data for p-shell hypernuclei. These experiments have confirmed the major peaks and subpeaks predicted by the DWIA calculations based on the normal-parity nuclear core wave functions coupled with a Lambda-hyperon in s- and p-orbits. At the same time, the data also show some extra subpeaks which seem difficult to be explained within the p-shell nuclear normal parity configurations employed so far.

Thus we have extended the model space so as to include the new configuration which consists of non-normal parity nuclear core-excited states and the Lambda in s-orbit. By this extension we emphasize that the Lambda-hyperon plays an interesting role to induce intershell mixing of the nuclear core-excited states having different parities. This is a challenge in view of the present-day hypernuclear spectroscopic study. The hypernuclear energy levels are calculated within the extended model space, and the obtained wave functions are used to estimate the spectroscopic amplitudes and the hypernuclear production cross sections of (gamma,K+) reactions. The calculated results are presented and discussed in comparison with the experiments.