



Nuclear Experiment

Isovector soft dipole mode in 6Be

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By using the $^1\text{H}(^6\text{Li},^6\text{Be})n$ charge-exchange reaction, continuum states in ^6Be were populated up to $E_t=16$ MeV, E_t being the ^6Be energy above its three-body decay threshold. In kinematically complete measurements performed by detecting $\alpha+p+p$ coincidences, an E_t spectrum of high statistics was obtained, containing approximately $\sim 5 \times 10^6$ events. The spectrum provides detailed correlation information about the well-known 0^+ ground state of ^6Be at $E_t=1.37$ MeV and its 2^+ state at $E_t=3.05$ MeV. Moreover, a broad structure extending from 4 to 16 MeV was observed. It contains negative parity states populated by $\Delta L=1$ angular momentum transfer without other significant contributions. This structure can be interpreted as a novel phenomenon, i.e. the isovector soft dipole mode associated with the ^6Li ground state. The population of this mode in the charge-exchange reaction is a dominant phenomenon for this reaction, being responsible for about 60% of the cross section obtained in the measured energy range.

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