Nuclear Experiment

Isovector soft dipole mode in 6Be

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(Submitted on 10 Jun 2011)

Continuum 6Be states up to excitation energy about 16 MeV were populated in the p(6Li,6Be)n charge-exchange reaction (the excitation energy is considered from the three-body alpha+p+p threshold). High statistics energy spectrum of 6Be (about ten millions events) was obtained in the kinematically complete measurements by detecting alpha+p+p coincidences. The detailed correlation information about the well-known 6Be 0(+) ground state at 1.37 MeV and the 2(+) state at 3.05 MeV was obtained. A broad structure extending from 4 to 16 MeV contains negative parity states, populated by L=1 angular momentum transfer, without other significant contributions. This continuum structure can be interpreted as a novel phenomenon: the isovector soft dipole mode associated with the 6Li ground state. The population of this mode in the charge-exchange reaction is a major phenomenon for the involved systems: it is responsible for about 60% of the cross section obtained in the measured energy range.

Comments: 7 pages, 6 figures
Subjects: **Nuclear Experiment (nucl-ex)**; Nuclear Theory (nucl-th)
Cite as: **arXiv:1106.2179v1 [nucl-ex]**

Submission history

From: Irina Egorova [view email]
[v1] Fri, 10 Jun 2011 21:41:15 GMT (643kb)

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