

## EVIDENCE OF A $(1d_{5/2})^2$ COMPONENT TO THE $^{12}\text{Be}$ GROUND STATE

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Data have been obtained on exclusive single neutron knockout cross sections from  $^{12}\text{Be}$  to study its ground state structure. The cross sections for the production of  $^{11}\text{Be}$  in its ground state ( $1/2^+$ ) and first excited state (0.32 MeV,  $1/2^-$ ) have previously been measured [1], indicating a strong  $(2s_{1/2})^2$  component to the  $^{12}\text{Be}$  ground state. In the present experiment, performed at the GANIL laboratory, cross sections for the first (0.32 MeV,  $1/2^-$ ) and second (1.78 MeV,  $5/2^+$ , *unbound*) excited states in  $^{11}\text{Be}$  were measured, which gives information on the admixture of  $(1p_{1/2})^2$  and  $(1d_{5/2})^2$  components in the ground state of  $^{12}\text{Be}$ .

A fragmentation beam of  $^{12}\text{Be}$  of  $\sim 10000$  pps (95% pure) was incident on a carbon target at 41 MeV/u. The beam particles were tracked onto the target, and their energies were measured event-by-event. The beam-like residues were measured in a position sensitive telescope mounted at zero degrees, and neutrons were measured in the DÉMoN array [1]. The  $1/2^-$  state of  $^{11}\text{Be}$  was identified by measuring coincident 320 keV  $\gamma$ -rays, using four NaI detectors. Full kinematic reconstruction of unbound states in  $^{11}\text{Be}$  was performed using coincident neutrons and  $^{10}\text{Be}$  ions. Neutron angular distributions in the laboratory frame were measured in coincidence with  $^{10,11}\text{Be}$ , and momentum distributions of neutrons and beam-like particles were measured for exclusive reaction channels. Data were also acquired for the Coulomb excitation and breakup of  $^{11}\text{Be}$  on Pb and C targets.

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