

STUDY ON NEUTRON-NEUTRON CORRELATION IN BORROMEAN NUCLEUS ^{11}Li VIA THE QUASI-FREE (p, pn) REACTION

Y. Kubota^{1,2}, A. Corsi³, G. Authelet³, H. Baba², C. Caesar⁴, D. Calvet³, A. Delbart³, M. Dozono¹, J. Feng⁵, F. Flavigny⁶, J.-M. Gheller³, J. Gibelin⁷, A. Giganon³, A. Gillibert³, K. Hasegawa⁸, T. Isobe², Y. Kanaya⁹, S. Kawakami⁹, D. Kim¹⁰, Y. Kiyokawa¹, M. Kobayashi¹, N. Kobayashi¹¹, T. Kobayashi⁸, Y. Kondo¹², Z. Korkulu¹³, S. Koyama¹¹, V. Lapoux³, Y. Maeda⁹, F. M. Marqués⁷, T. Motobayashi², T. Miyazaki¹¹, T. Nakamura¹², N. Nakatsuka^{14,2}, Y. Nishio¹⁵, A. Obertelli³, A. Ohkura¹⁵, N. A. Orr⁷, S. Ota¹, H. Otsu², T. Ozaki¹², V. Panin², S. Paschalis⁴, E. C. Pollacco³, S. Reichert¹⁶, J.-Y. Rousse³, A. T. Saito¹², S. Sakaguchi¹⁵, M. Sako², C. Santamaria³, M. Sasano², H. Sato², M. Shikata¹², Y. Shimizu², Y. Shindo¹⁵, L. Stuhl², T. Sumikama⁸, M. Tabata¹⁵, Y. Togano¹², J. Tsubota¹², T. Uesaka², Z. H. Yang², J. Yasuda¹⁵, K. Yoneda², and J. Zenihiro²

¹Center for Nuclear Study, University of Tokyo; ²RIKEN Nishina Center; ³CEA, Saclay; ⁴Department of Physics, Technische Universität Darmstadt; ⁵Department of Physics, Peking University; ⁶IPN Orsay; ⁷LPC Caen; ⁸Department of Physics, Tohoku University; ⁹Department of Applied Physics, University of Miyazaki; ¹⁰Department of Physics, Ehwa Womans University; ¹¹Department of Physics, University of Tokyo; ¹²Department of Physics, Tokyo Institute of Technology; ¹³MTA Atomki; ¹⁴Department of Physics, Kyoto University; ¹⁵Department of Physics, Kyushu University; ¹⁶Technische Universität München

Dineutron correlation is one of the specific phenomena expected to appear in neutron drip-line nuclei. It has been studied using different approaches, such as the break up reaction, etc. However, currently available data seem to be insufficient in terms of (i) the decomposition of high-angular-momentum components, (ii) the extraction of core excitation components, (iii) and the effect of final state interactions (FSIs). In the present study, (i) the MINOS target was used for higher luminosity, (ii) γ rays were detected to tag the core excitation, (iii) and the quasi-free (p, pn) reaction was employed to minimize the FSI. In order to determine the momentum distribution of two valence neutrons, a kinematically complete measurement was performed at the RIKEN RIBF. The opening angle between the two neutrons was reconstructed from the measured momentum vectors of all the particles. The experiment was carried out by using the SAMURAI spectrometer combined with the MINOS TPC tracking system. Recoil particles were measured by the neutron detector array WINDS and a recoil proton detector setup, developed for this project. The details of experimental setup and results will be presented.