Experiments of Few-Nucleon Scattering and Three-Nucleon Force Effects

K. Sekiguchi\textsuperscript{1}, Y. Wada\textsuperscript{1}, T. Watanabe\textsuperscript{1}, D. Eto\textsuperscript{1}, T. Akieda\textsuperscript{1}, H. Kon\textsuperscript{1}, K. Miki\textsuperscript{1}, N. Sakamoto\textsuperscript{2}, H. Sakai\textsuperscript{2}, M. Sasano\textsuperscript{2}, Y. Shimizu\textsuperscript{2}, H. Suzuki\textsuperscript{2}, T. Uesaka\textsuperscript{2}, Y. Yanagisawa\textsuperscript{2}, M. Dozono\textsuperscript{3}, S. Kawase\textsuperscript{3}, Y. Kubota\textsuperscript{3}, C. S. Lee\textsuperscript{3}, K. Yako\textsuperscript{3}, Y. Maeda\textsuperscript{4}, S. Kawakami\textsuperscript{4}, T. Yamamoto\textsuperscript{4}, S. Sakaguchi\textsuperscript{5}, T. Wakasa\textsuperscript{5}, J. Yasuda\textsuperscript{5}, A. Ohkura\textsuperscript{5}, Y. Shindo\textsuperscript{5}, M. Tabata\textsuperscript{5}, E. Milman\textsuperscript{6}, S. Chebotaryov\textsuperscript{6}, H. Okamura\textsuperscript{7}, and T. L. Tang\textsuperscript{7}

\textsuperscript{1}Department of Physics, Tohoku University, Sendai, 980-8578, Japan
\textsuperscript{2}RIKEN Nishina Center, Wako, Saitama 351-0198, Japan
\textsuperscript{3}Center for Nuclear Study, University of Tokyo, Bunkyo, Tokyo 113-0033, Japan
\textsuperscript{4}Faculty of Engineering, University of Miyazaki, Miyazaki, 889-2192, Japan
\textsuperscript{5}Department of Physics, Kyushu University, Higashi, Fukuoka 812-8581, Japan
\textsuperscript{6}Department of Physics, Kyungpook National University, Daegu, South Korea
\textsuperscript{7}RCNP, Osaka University, Ibaraki, Osaka, 567-0047, Japan

Understanding the nuclear properties from bare nuclear forces is one of the main topics in nuclear physics. Recently the importance of three-nucleon forces (3NFs), which appear when more than two nucleons interact, has been indicated in various nuclear phenomena, such as few-nucleon scattering, binding energies of nuclei, and equation of state of nuclear matter.

Few-nucleon scattering at intermediate energies ($E \gtrsim 60$ MeV/nucleon) is one attractive approach to investigate the dynamical aspects of 3NFs, such as momentum, spin and iso-spin dependences [1, 2]. In this system rigorous numerical calculations in terms of Faddeev theory based on bare nuclear potentials are available. Direct comparison between the calculations and precise data enables us to extract the effects of 3NFs quantitatively.

With the aim of clarifying the roles of 3NFs in nuclei experimental programs of few-nucleon scattering with polarized deuteron beams are in progress at RIKEN [3]. In the conference, recently obtained data are presented together with the theoretical predictions.

References

