Measurement of Spin-Correlation Functions in the Finial State of *pd* Elastic Scattering

A. Tamii[a], M. Dozono[b], K. Fujita[a], K. Hatanaka[a], E. Ihara[b], T. Kaneda[a], H. Kuboki[c], Y. Maeda[d], H. Matsubara[a], T. Ohta[a], H. Okamura[a], H. Sakai[c], Y. Sakemi[a], Y. Satou[e], K. Sekiguchi[f], Y. Shimizu[a], H. Suda[d], M. Takechi[a], Y. Tameshige[a], H. Tanabe[b], N. Uchigashima[c], T. Uesaka[d], T. Wakasa[b], and K. Yako[c]

[a]*Research Center for Nuclear Physics, Osaka University, Ibaraki, Osaka 567-0047, Japan*
[b]*Department of Physics, Kyushu University, Higashi, Fukuoka 812-8581, Japan*
[c]*Department of Physics, University of Tokyo, Bunkyo, Tokyo 113-0033, Japan*
[d]*Center for Nuclear Study, University of Tokyo, Bunkyo, Tokyo 113-0033, Japan*
[e]*Department of Physics, Tokyo Institute of Technology, Meguro, Tokyo 152-8551, Japan*
[f]*The Institute of Physical and Chemical Research, Wako, Saitama 351-0198, Japan*

From high precision measurements of the proton(*p*)-deuteron(*d*) elastic scattering and much progress of Faddeev calculations using modern nucleon-nucleon (*NN*) forces, signatures of three-nucleon force (3NF) effect are becoming observed in the differential cross section data at intermediate energies, *e.g.* 135 MeV/*A*. By adding 3NFs, differential cross sections and deuteron vector analyzing powers have been well reproduced, while other spin observables, such as tensor analyzing powers and polarization transfer coefficients, are not well or even worse reproduced. At a higher incident energy of 250 MeV/*A*, discrepancy between data and theoretical predictions becomes larger for differential cross sections and proton analyzing powers at backward angles.

For the purpose of obtaining systematic data concerning various spin observables at higher energies, we planned to measure the *pd* elastic scattering data at 392 MeV at the Research Center for Nuclear Physics. In this plan, two outgoing particles, deuteron and proton, are detected by using magnetic spectrometers Grand Raiden and LAS, respectively, and polarizations of both particles are simultaneously measured by employing two focal plane polarimeters. A triple spin correlation coefficient $C_{y(p)}^{y'(p),y'(d)}$ and a double spin correlation coefficient $C^{y'(p),y'(d)}$ will be measured in addition to proton analyzing power, two induced polarizations, and two spin transfer coefficients.

A feasibility test experiment for measuring spin-correlation functions has been done. In this conference, we will report on the results.