Implications for the πNN coupling from spin transfer measurements in pp elastic scattering at 200 MeV

Scott W. Wissink, for the IUCF E367 Collaboration

Dept. of Physics and Indiana University Cyclotron Facility, Bloomington, Indiana, USA

Abstract. A detailed study of spin transfer in pp elastic scattering near 200 MeV has been carried out at the Indiana University Cyclotron Facility. The new data have much smaller uncertainties than all previous measurements, and span a kinematic range selected specifically to maximize sensitivity to the neutral πNN coupling constant g_0^2, a fundamental quantity in nuclear physics whose value remains highly controversial. Our results provide strong support for modern potential models of the NN interaction which use a relatively weak pion coupling ($g_0^2 \approx 13.6$), but disagree significantly with the predictions of models in which g_0^2 is $\sim$ 14.4. Working in a one-boson-exchange framework, calculations suggest that most of these latter differences can be removed just by reducing the strength of g_0^2 from 14.4 to 13.6 for the long-range (higher partial wave) pion contributions in these models.

Isospin Identification for $A = 25$ Mirror Nuclei by High Resolution $(p,\ p')$ and $(^3\mathrm{He},\ t)$ Experiments

Y. Shimbara, H. Fujita, Y. Fujita, T. Adachi, H. Fujimura*, K. Harada, K. Katori, T. Shinada, H. Ueno, A. D. Bacher†, G. P. A. Berg*, C. C. Foster†, K. Hara*, K. Hatanaka*, J. Jänecke‡, J. Kamiya*, T. Kawabata§, S. Mizutori, T. Noro*, D. A. Roberts‡, E. J. Stephenson†, M. Yoshifuku, and M. Yosoi§

Department of Physics, Osaka University, Toyonaka, Osaka 560-0043, Japan
* *Research Center for Nuclear Physics, Osaka University, Ibaraki, Osaka 567-0047, Japan*
† *Indiana University Cyclotron Facility, Bloomington, Indiana 47408, USA*
‡ *Department of Physics, University of Michigan, Ann Arbor, Michigan 48109, USA*
§ *Department of Physics, Kyoto University, Sakyo, Kyoto 606-8224, Japan*

Gamow-Teller and $M1$ states excited in ^{25}Mg(^{3}He, t)^{25}Al and ^{25}Mg(p, p′) reactions at 0° and 450 MeV incident energy, respectively, have been measured and compared. Good symmetry structure in the mirror nuclei ^{25}Al and ^{25}Mg has been identified up to the highest measured excitation energy of $E_x \sim 16$ MeV.

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