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Determination of the Polarization Transfer Coefficient, K_z^z , for the ${}^3\text{H}(\vec{p}, \vec{n})$ Reaction at Low Energies¹ J. R. WALSTON, C. R. GOULD, D. G. HAASE, B. W. RAICHLE, M. L. SEELY, North Carolina State University and TUNL, W. TORNOW, W. S. WILBURN, Duke University and TUNL, C. D. KEITH, IUUCF, G. W. HOFFMANN, UT at Austin, S. I. PENTTILÄ, LANL — We report measurements of the zero degree longitudinal polarization transfer coefficient K_z^z for the reaction ${}^3\text{H}(\vec{p}, \vec{n})$. Recent calculations of the structure of K_z^z show pronounced variation below 1 MeV neutron energy due to the presence of the 0^- level in ${}^4\text{He}$. Taking advantage of the large spin dependent longitudinal n-p cross section difference, $\Delta\sigma_L$, a dynamically polarized proton target was effectively used as a neutron polarimeter. The polarized neutrons were produced by 1.3-2.7 MeV longitudinally polarized protons incident on a tritiated titanium foil. Our measurements confirm resonance behavior in K_z^z , with peak values approaching 80% near 800 keV neutron energy. The ${}^3\text{H}(\vec{p}, \vec{n})$ reaction is a good source of longitudinally polarized neutrons in the 0.6-0.9 MeV neutron energy range.

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Prefer Oral Session
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