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Polarized photon scattering of ^{52}Cr : Determining the parity of dipole states FNU KRISHICHAYAN, M. BHIKE, W. TORNOW, TUNL, Duke University — Observation of dipole states in nuclei are important because they provide information on various collective and single-particle nuclear excitation modes, e.g., pygmy dipole resonance (PDR) and spin-flip M1 resonance. The PDR has been extensively studied in the higher and medium mass region, whereas not much information is available around the low mass ($A \sim 50$) region where, apparently, the PDR starts to form. The present photoresponse of ^{52}Cr has been investigated to test the evolution of the PDR in a nucleus with a small number of excess neutrons as well as to look for spin-flip M1 resonance excitation mode. Spin-1 states in ^{52}Cr between 5.0 to 9.5 MeV excitation energy were excited by exploiting fully polarized photons using the (γ, γ') nuclear resonance fluorescence technique, a completely model-independent electromagnetic method. The de-excitation γ -rays were detected using a HPGe array. The experiment was carried out using the HIGS facility at TUNL. Results of unambiguous parity determinations of dipole states in ^{52}Cr will be presented.

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