Abstract Submitted
for the HAW09 Meeting of
The American Physical Society

Nuclear photon scattering experiments by quasi-monochromatic, linearly polarized light sources T. SHIZUMA, T. HAYAKAWA, JAEA, H. OHGAKI, Kyoto Univ., H. TOYOKAWA, AIST, T. KOMATSUBARA, Univ. of Tsukuba, N. KIKUZAWA, JAEA, A. TAMII, Osaka Univ., H. NAKADA, Chiba Univ. — Magnetic dipole (M1) transitions in atomic nuclei have attracted increasing attention in nuclear physics and nuclear astrophysics. The knowledge of the M1 response allows one to elucidate the details of nuclear dynamics. It is also important for the estimate neutral current neutrino-nucleus cross sections for supernova explosion, because of the close relationship between the M1 excitation and neutrino-nucleus processes. Low-lying electromagnetic transitions can be studied by the method of nuclear resonance fluorescence (NRF) or photon scattering. Recently, it has been shown that quasi-monochromatic, linearly polarized photon beams from inverse laser Compton scattering has considerably increased experimental sensitivity and to enable one to detect the fine structure of relatively weak M1 transitions. In this report, results of the NRF measurements on ^{208}Pb using a linearly polarized photon beam will be presented. The M1 resonance below the neutron separation energy is resolved into several individual transitions. The experimental results are compared with an estimation of self-consistent random phase approximation using a semi-realistic interaction.

Toshiyuki Shizuma
Japan Atomic Energy Agency

Date submitted: 01 Jul 2009

Electronic form version 1.4