Measurement of 4He photodisintegration in the giant dipole resonance energy region

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The ^{4}He photodisintegration reaction is expected to be a clue to the nucleosynthesis induced by neutrinos during the core collapse supernovae[1] and recent study suggests the ^{4}He photodisintegration cross section may give constraints on the scenario of the big bang nucleosynthesis including relic particles[2].

A couple of charge-conjugate reaction ^{4}He(γ,^{1}H ^{3}H) and ^{4}He(γ, ^{3}He)n has been studied but the present experimental data still shows the serious disagreement in the low energy region around the giant dipole resonance (GDR) [3][4][5]. To break this deadlocked situation, we performed the measurement using our active target, MAIKo. The MAIKo active target is a Time Projection Chamber (TPC) filled with gas of target nuclei, and capable to measure particle trajectory and energy deposition in the sensitive volume. Since the reaction occurs in the sensitive volume of the active target, very short-range low-energy particles emitted from ^{4}He nuclei are detectable.

The experiment was carried out at the New SUBARU synchrotron radiation facility in Japan. The laser Compton scattering (LCS) photon beam emitted from Compton scattering of a laser photon by an electron in the storage ring is available at beamline BL01 in NewSUBARU. The measurement was performed using 22--35 MeV photon beam. In this presentation, the current status of data analysis is reported.

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