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Experimental studies of photonuclear reactions relevant to astrophysical nucleosynthesis

TATSUSHI SHIMA, RCNP, Osaka University

Nuclear reactions and transitions caused by the electromagnetic interaction are considered to play important roles in various processes occurring in stars and in the early universe, and therefore precise data of the photonuclear reactions as well as their inverse radiative capture reactions are indispensable for quantitative studies of astrophysical nucleosynthesis. Photonuclear reactions are also useful to probe the analogous neutrino-induced nuclear reactions by weak neutral current, which are supposed to play critical roles in the dynamics of Type-II supernova explosions and in accompanying neutrino-induced nucleosynthesis. Recently developed γ-ray sources based on the Compton backscattering of laser photons with relativistic electrons are expected to provide a powerful tool for high-precision experiments on photonuclear reactions at astrophysically important energies, because they have nice features such as quasi-monochromatic and tunable energy, little background, high polarization, small angular spread, and so on. In this contribution the current status of the backscattered γ-ray facilities in the intermediate energy regions will be introduced, and some topics on nuclear astrophysics studies at those facilities will be presented.