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Studies of gamma-ray and neutron induced reactions with an active-target Time Projection Chamber

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An active-target Time Projection Chamber (TPC) has been developed at the University of Warsaw to investigate the photo-disintegration reactions relevant for nuclear astrophysics and for studies of nuclear structure phenomena, e.g. alpha-clustering effects in light nuclei.
Recently, the performance of the detector was tested in experiments conducted at the Van de Graaf accelerator at the IFJ PAN in Cracow, Poland. There, a 13 MeV gamma beam produced in the ^{15}N(p, γ)^{16}O reaction was interacting with the CO_2 gas in the TPC. Events corresponding to the ^{16}O(γ, α)^{12}C reaction were clearly observed.
At the IGN-14 MeV neutron source at the IFJ PAN, the ^{12}C(n,n') reaction was investigated with the goal to observe population and 3-alpha decay of the Hoyle state in ^{12}C.
In this contribution first results of these measurements will be presented and an outlook for future studies will be discussed.

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