Measurement of the ^{3}He(α,γ)^{7}Be gamma-ray angular distribution

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The ^{3}He(α,γ)^{7}Be reaction affects the nucleosynthesis of ^{7}Li as well as the predicted solar ^{7}Be and ^{8}B neutrino fluxes. It is being studied over a wide energy range at the Rossendorf 3 MV Tandetron accelerator, with a focus on the measurement of the γ-ray angular distribution at E≈1 MeV.
There are multiple and overlapping precise experimental data sets at E = 0.7 - 1.3 MeV. Any extrapolation of this precise data down to a unique data set from an experiment of the LUNA collaboration at E = 0.09 MeV - 0.13 MeV has to deal with the fact that at E = 1 MeV, the capture is possible both from s-wave incident particles and from d-wave incident particles, whereas at 0.1 MeV and lower the d-wave component plays no role due to the angular momentum barrier. A measurement of the angular distribution of the emitted γ-rays at E = 1 MeV may constrain the relative contributions of s-wave and d-wave components at high energies and thus enable a better comparison between the high-energy and the low-energy data points.
Data from a first run for the angular distribution of the emitted prompt γ-rays in the ^{3}He(α,γ)^{7}Be reaction was done using a setup of four HPGe detectors at various angles and shall be presented here.