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Measurement of the 3He(a,g)7Be gamma-ray angular distribution

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The 3He(a,g)7Be reaction affects the nucleosynthesis of 7Li as well as the predicted solar 7Be and 8B 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 gamma-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=0.09-0.13 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 gamma-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 gamma-rays in the 3He(a,g)7Be reaction was done using a setup of four HPGe detectors at various angles and shall be presented here.

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