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AGATA@GANIL(E703): Studies of excited states in 102,103Sn to deduce two-body neutron interactions, single-particle energies and N=Z=50 core excitations

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The E703 experiment was performed at GANIL in April–May 2018, with the setup of AGATA-NEDA-DIAMANT. This measurement aimed at the observation of gamma rays emitted from excited states of the nuclei 102Sn and 103Sn, from which two-body neutron interactions, single-particle energies and N=Z=50 core excitations could be inferred. The data analysis is pursued in Warsaw, Stockholm and Uppsala.
In depth optimisation of conditions of AGATA-NEDA-DIAMANT event building, NEDA neutron-gamma discrimination, NEDA two-neutron discrimination, DIAMANT charged particle identification and of the timing of all the components of the system were done. Stability corrections and calibrations were also completed. Several replays of the entire data set were run, with various event-building time conditions, and multiplicity conditions of the three used detector systems. This was necessary in order to enable study of both delayed and prompt gamma-ray radiation, emitted from states below and above the 6+ isomeric state in102Sn (T½ = 400 ns).
These procedures resulted in a very clean identification of events in which the two known gamma rays of 102Sn, namely 497 and 1472 keV, were registered. The statistics of the identified events is very low, though. In the gamma-gamma coincidence spectrum gated on the 1472 keV line, obtained with the condition that 2 neutrons and 1 alpha particle are registered, as well as that the two gamma rays are registered within a 50 ns window, but could be delayed up to 2 μs with respect to the prompt RF signal, there are 15 counts in the 497 keV peak. The spectrum contains virtually no background.
The analysis of the data is continued, with the aim to identify new gamma-ray transitions emitted from excited states of 102Sn.

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