

MEMORANDUM

concerning proposal INTC-P-269

Neutron capture cross section measurements of ^{238}U , ^{241}Am and ^{243}Am at n_TOF

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The proposal INTC-P-269 with the title “Neutron capture cross section measurements of ^{238}U , ^{241}Am and ^{243}Am at n_TOF” has been presented to the INTC in its session of May 2009. The proposal concerns capture measurements on the three actinides ^{238}U , ^{241}Am and ^{243}Am with the two different capture detector systems available at n_TOF: the neutron-insensitive C_6D_6 total-energy detectors, and the BaF_2 4π total absorption calorimeter (TAC). The measurements on ^{241}Am and ^{243}Am are part of the deliverables in the EC-FP6 programme IP-EUROTRANS, funded up to the end of 2010, while the measurements on ^{238}U and ^{241}Am are part of the recently started EC-FP7 programme ANDES.

The INTC has favourably assessed the scientific value of the proposal and has underlined the importance of obtaining high quality capture data for these isotopes. In its minutes of June 2009 (CERN/INTC-2009-033) the INTC recommended only the requested number of protons of 8×10^{18} p.o.t for the $^{241,243}\text{Am}$ measurements for approval by the Research Board, invoking the limited number of protons allocated by that time to n_TOF. The Committee also suggested that the Collaboration should discuss the schedule of the measurements.

There have been remarkable improvements at n_TOF since the recommendations of the INTC were formulated. First, the n_TOF Experimental Area has become a Work Sector Type A and will be operational in May 2010, allowing the use of radioactive targets without a massive and ISO-compliant sealing. Furthermore, the number of protons allocated to n_TOF in 2010 is currently also larger than foreseen in 2009. Finally, there is a unique opportunity of using a high purity ^{238}U sample from a new supplier, which could be delivered to CERN in a relatively short time. We are therefore confident to be able to perform the $^{238}\text{U}(n,\gamma)$ measurement in 2010 or 2011. Concerning the delivery of samples, we would like to stress that finding, negotiating, chemically transforming, physically preparing and transporting suitable radioactive samples is an extremely involved task and should in general be seen on a time scale of years. The n_TOF Collaboration Board regularly reviews its measurements schedule in order to adapt the plan of measurements in view of accepted experiments and the availability of samples.

Given the above and the fact that INTC already was positive about the scientific value of the proposal, we would like to request the INTC to recommend also the ^{238}U experiments for approval by the Research Board.

