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## **Integral Benchmark Experiments on a Large Copper Block using GELINA accelerator to validate natural Cu neutron inelastic scattering cross sections from different neutron cross section databases.**

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A neutronics integral benchmark experiment on a pure Copper block (dimensions 60x60x60 cm<sup>3</sup>), aimed at testing and validating recent nuclear data libraries has been performed at GELINA. GELINA is a powerful photo-neutron source using 75 nA, 110 MeV electron current impinging on a depleted 238U rotating target, producing a white spectrum with neutron energies ranging from epithermal region up to about 20 MeV with a mean energy of about 1.4 MeV and intensity up to 3.2E13 n/s. A large natCu block has been positioned at 100 cm from the target. The block had seven positions at different depths respect to the main neutron propagation direction where thin activation foils were used as neutron flux probes. Materials which are activated by different neutron energies were used and the measured fluxes were compared with calculations performed with MCNP5 neutron transport code employing different neutron cross sections database for comparison. With the MCNP5 it was modelled the neutron spectrum produced by GELINA accelerator and the neutron transport inside the block describing all the most relevant components of the experiment. This is the first time that a neutronics integral experiment on Copper is performed using such a white neutron spectrum and the results of the our comparison are used to validate the neutron inelastic scattering cross sections.

### **Eligible for student paper award?**

No

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