

## Source requirements for spectrometers at low energy accelerator driven neutron facilities

**Jörg VOIGT<sup>1</sup>, Paul ZAKALEK<sup>1</sup>, Ulrich RÜCKER<sup>1</sup>, Jingjing LI<sup>1</sup>, Zhanwen MA<sup>1</sup>, Klaus LIEUTENANT<sup>1</sup>, Thomas GUTBERLET<sup>1</sup>, Thomas BRÜCKEL<sup>1</sup>**

<sup>1</sup>Jülich Centre for Neutron Sciences, Forschungszentrum Jülich GmbH, 52425 Jülich, Germany

The shutdown of several national reactor driven neutron sources has stimulated intense research and development activities for successor facilities[1]. A promising technology is the neutron production by low energy nuclear reactions, that can be driven by accelerators operating in the particle energy range between 3 and 100 MeV. While the neutron yield of these reactions is much lower than the neutron yield of the spallation reaction, the lower particle energy enables a very close coupling of the thermal and cryogenic moderators to the target and therefore small volume moderators with a high density of slow neutrons. On the other hand, the comparably low particle energies facilitate the shielding issue significantly and allow therefore neutron optical components in a distance as close as 50 cm from the thermal or cold moderator surfaces allowing the extraction of a reasonably divergent beam from the source, which can be efficiently transported to the sample by modern neutron optics. Therefore instruments, which require a large phase space, can benefit strongly from the characteristics of a low energy accelerator driven neutron facility (LENF). Among them are typically spectrometers of both direct and indirect geometry, which require typically relaxed spatial and angular resolution and a good energy resolution. Here we present source parameters that have been determined for different spectrometers employing thermal and cold neutrons.

[1] T. Gutberlet *et al.*, Neutron news **31**(2-4), 37-43 (2020), F. Ott *et al.*, Neutron news **31**(2-4), 26-31 (2020)

E-mail for corresponding author: j.voigt@fz-juelich.de