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A facility for fast-neutron irradiations at Jyvsäkylä and its use for nuclide cross-section measurements in fission

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Abstract content
   (Max 300 words)

An efficient and reliable transport system for fast-neutron irradiations has been built at the Physics Department, Jyväskylä, Finland. It is constructed from commercial bicycle components and is driven by a computer-controlled stepping motor. It can be operated in single or cyclic mode. The neutron irradiated targets are moved within 1.2 seconds (full stop to full stop) to a well-shielded position 3 meters away where they can be removed or directly investigated by gamma spectroscopy. The system has been built with the aim to experimentally verify the calculated production rates of neutron-rich nuclei in the Spiral2 uranium target. However, the facility can be used for various kinds of fast-neutron irradiations, with a neutron spectrum up to 60 MeV produced by stopping a deuteron beam of several uA in a thick target. Examples of applications are activation and integral cross-section measurements, evaluation of damages in materials and biological cells.

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