

# Neutron depth profiling for materials science application

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Neutron Depth Profiling (NDP) is a non-destructive, near-surface analytical technique to selectively study the distribution of several light elements with high lateral and depth resolution [1]. Upon capture of a neutron, the investigated elements emit charged particles, which carry the depth information of the parent nuclei and are detected via surface barrier detectors. NDP offers a wide range of application for several branches of materials science, as polymer, metal alloy and microelectronic materials [2]. We focus on the construction and testing of a NDP beamline at the Forschungs-Neutronenquelle Heinz Maier-Leibnitz (MLZ) at the Prompt gamma-ray activation analysis facility (PGAA). Here we utilize a high cold neutron beam flux up to  $6 \cdot 10^{10} \text{ n cm}^{-2} \text{ s}^{-1}$  [3], which enables novel NDP characterization pathways for materials science.

[1] Y. He et al., Journal of Power Sources 2015, 287, 226-230.

[2] R. G. Downing et al., J. Res. Natl. Inst. Stand. Technol. 1993, 98, 109.

[3] L. Canella et al., Nucl. Instr. Meth. Phys. Res. A 2011, 636(1), 108-113.

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