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Neutron Physics Laboratory Řež (CZ) and its instrumentation for investigation of structure and microstructure of advanced materials

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Neutron Physics Laboratory (NPL) of CANAM infrastructure (operated by Nuclear Physics Institute Řež), canam.ujf.cas.cz/npl, and its instrumentation for investigation of structure and microstructure of advanced materials will be presented. NPL consist of five neutron diffractometers (residual stress scanning, powder diffraction, small-angle neutron scattering, in-situ thermomechanical tests and neutron-optics testing diffractometers) and of three nuclear analytical techniques (Neutron Depth Profiling, Prompt Gamma Activation Analysis, Neutron Activation Analysis). The laboratory provides open access to academic users on the basis of proposals continuously evaluated by the international Scientific selection panel.

Recently, several instruments were upgraded by new neutron-optics components, by new sample environment, as well as by sample preparation and auxiliary facilities. The strain scanner was equipped by radial neutron collimator, SANS diffractometer by a new bending holder with long analyzer crystal. New portable neutron camera facilitates sample adjustment within sample environment. A system for concurrent in situ neutron diffraction, mechanical testing and acoustic emission detection was obtained. Nuclear analytical techniques were improved by supermirror neutronguide, by electrochemical impedance analyzer, by cryogenic mill and by electrical fusion furnace.

Selected examples from the studies with help of neutron physics facilities carried out at NPL will be presented.

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