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Neutron Imaging Facilities at PSI

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Neutron imaging capabilities are allocated at the Swiss spallation neutron source SINQ since the beginning of its operation in 1997. The first beam line for this kind of studies –NEUTRA - has been built at a thermal beam port with low gamma background and a well defined neutron distribution. Investigations for different research groups and also for industry have been performed by using several kinds of digital imaging detection systems with their well-known superior performance. In particular, NEUTRA enables neutron tomography on different size scales, time-dependent studies and the investigation of highly activated material in the NEU-RAP configuration of NEUTRA.

Recently, we implemented an X-ray tube too with high voltages until 320 kV with the aim to enable pixel-wise referenced imaging in combination with the neutron image data.

ICON is a second imaging facility at a cold beam port with the direct view to the cold D2-moderator. The beam can be tuned in respect to collimation or intensity by means of different apertures in a selection wheel. With the help of an optional turbine-type energy selector or with an implemented Be-filter the neutron spectrum can be modified. A band filter type device (TESI) based on the reflection at single crystals is under completion and will be used for the further narrowing of the spectrum.

Furthermore, a grating interferometer has been built for phase-contrast type and dark field imaging studies. ICON is equipped with three different camera based detection systems, among them a micro-setup with presently highest spatial resolution.

The test beam line BOA which is designed for methodical studies and used only PSI internally is already equipped with an imaging detection system. The beam at BOA is polarized and has a quite high intensity of very cold neutrons. These properties look very promising for future interesting studies and developments at PSI.

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