

50 Years of Neutron Backscattering Spectroscopy



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BATS and GaAs for IN16B at ILL

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The neutron backscattering spectrometer IN16B at ILL was conceived with the flexibility to receive new concepts of instrument developments in the future. Two additional instrument configurations are being implemented at the moment, both aiming to increase the dynamic range of the spectrometer in different directions (see figure):

The backscattering and time-of-flight spectrometer option **BATS** turns IN16B into a flexible, inverted ToF instrument by adding a high speed chopper system 34 m upstream of the sample position. This extends the energy transfer range by nearly one order of magnitude. In the case of Si111 analyzers a movable window of $\pm 250 \mu\text{eV}$ with a tunable resolution of 2-9 μeV FWHM will be provided.

With the **GaAs** prototype option, the feasibility for a user-scale spectrometer with significantly improved energy resolution is explored, aiming at 50 neV resolution in a Q-range of 0.2 to 2 \AA^{-1} with several μeV energy transfer range. This prototype bears many challenges in the instrument design, but it can certainly open new experimental opportunities and possibly new science.

Commissioning of both these options is planned for the end of 2016.

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