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NEW DEVELOPMENTS ON THE SANS INSTRUMENT D11 AT THE ILL

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D11 is the archetype of a small-angle neutron scattering, the longest ever built (2 x 40m), and the first one equipped with a two-dimensional detector. It is in user operation since 1972 [1] and serves many fields of scientific research from magnetism over chemistry and biology to soft condensed matter, all benefitting from an extended q-range accessible and the high flux of the ILL reactor. D11 covers a real space window from the nm towards the μm [2]. The majority of research projects coming to D11 fall into the soft condensed matter domain.

This contribution will present ongoing upgrades on D11, in particular the new multi-beam USANS setup, inspired by the SAMBA approach of R. Gähler [3]. This option should attract new users as it allows to extend further the q-range down to $\sim 3 \cdot 10^{-5} \text{ \AA}^{-1}$ while preserving a significant flux and allowing to record 2D patterns within 1 min to 1 h, at short wavelength to limit multiple scattering effects. The change of setup is fast (15 min) to let users switch between SANS and USANS modes at will.

The second part of this contribution deals with the large choice of sample-environments available for SANS at ILL, illustrated by recent results. In particular, a new in-situ DLS implementation and the new high-pressure cells for SANS will be highlighted.

Furthermore, the new layout of D11 as proposed and accepted in the framework of ILL's Endurance 2 upgrade program will be presented, notably with its high area, high count-rate detector and improved optics.

References

- [1] K. Ibel, J. Appl. Cryst. 9 (1976) 296.
- [2] P. Lindner, R. Schweins, Neutron News 21 (2010) 15.
- [3] R. Gähler, B. Fåk, R. Golub, T. Hils, S. Klimko, J. Lal, S. Prokudaylo, C. Stadler, Advances in Neutron Scattering Instrumentation, Proceedings of SPIE 4785 (2002) 153 .

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