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SANS instrumentation at ISIS TS-2 - successes and a few challenges

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The SANS2d beam line on the 10Hz repetition rate, second target station at the ISIS Facility has been running a successful user programme for some years. New 10bar ^3He , 8mm diameter gas tube arrays were installed in the spring of 2014 for the pair of $\sim 1\text{m}$ square movable detectors in the 13m long, 3.5m diameter vacuum tank. At 4m sample-detector distance SANS2d simultaneously uses neutron wavelengths of 1.75 to 16.5 \AA to cover a very broad Q range. This requires some care with data reduction procedures.

The new LARMOR beam line is very flexible, it will be able to use a range of spin-echo techniques, including SESANS and Larmor diffraction, in collaboration with TU-Delft as well as conventional SANS. LARMOR has recently taken first real beam following modification of the reflector layer around the neutron producing target which has opened a proper view of the coupled grooved moderator. Initial SANS results from LARMOR, suggest that this straight rather than bent beam line still has minimal background.

The ZOOM beam line is currently under construction, it will have a 1.8m x 1m detector in an 11m long vacuum. First beam is expected in the latter part of 2016. Monte-Carlo simulations of high energy particle transport showed that the original plan for a horizontal bender on ZOOM would result in high backgrounds due to its angle to the incoming proton beam. The beam line is now configured with a vertical bend. The longer term goal for ZOOM is to use focusing methods, at longer wavelengths, to be able to reach very small Q. Both ZOOM and LARMOR will have optional polarized beam using V cavity polarisers.

Designs and progress with each of these time of flight SANS beam lines, as well as some on-going challenges, will be illustrated.