



Contribution ID: 66

Type: **Talk**

Development of SEC-SANS for life science applications at ISIS TS2

Thursday, 10 June 2021 11:10 (20 minutes)

In-line size exclusion chromatography (SEC) is now routinely offered by a number of small-angle x-ray scattering (SAXS) instruments at synchrotron light sources, particularly those which focus on protein solution scattering, being pioneered on high flux undulator sources. There has recently been a successful demonstration of in-situ SEC-SANS [1, 2] at a reactor neutron source. Here, we demonstrate the feasibility of a SEC-SANS system on the time of flight SANS2 beamline. The test system consisted of a commercial Agilent HPLC and autosampler, connected to Shodex/Superdex columns, the output of which then flows through an adapted quartz cuvette. The cuvette includes 3-D printed inserts with a channel structure optimised to ensure the optimum flow of liquid within the exposure cell. Here, we will present results from a number of systems, including proteins, liposomes and membrane proteins in copolymer nanodiscs, demonstrating the feasibility and utility of SEC-SANS on a pulsed source for classical bioSANS and more generic biophysical systems of interest. We will discuss our thoughts for optimising the technique on a time of flight SANS instrument, including equipment design, such as the use of multiple binary pumps and valves, flow cell limitations through to data reduction and processing.

[1] Jordan et al, J. Appl. Cryst, 2016, 49, 2015-2020 [2] Tidemand Johansen et al, Acta Cryst D Structural Biology, 2018, D74, 1178-1191

Primary author: DOUTCH, James (STFC)

Co-authors: MAHMOUDI, Najet (STFC); KHUNTI, Nikul (Diamond Light Source); EDWARDS-GAYLE, Charlotte (Diamond Light Source); MORRISON, Kerrie A. (University of Bath); EDLER, Karen J. (University of Bath); RAMBO, Robert P. (Diamond Light Source); COWIESON, Nathan (Diamond Light Source)

Presenter: DOUTCH, James (STFC)

Session Classification: Protein structure, function and dynamics

Track Classification: Protein structure, function and dynamics