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ALSA – Automatic Laue Sample Aligner

Tuesday, 19 October 2021 18:00 (10 minutes)

Each of you will be familiar with the well-known chart of the dependence of the flux of large synchrotron and neutron infrastructures on time. While synchrotron power continues to increase by orders of magnitude, neutrons reached their highest power 50 years ago at ILL and it will be slightly surpassed with the help of ESS. Therefore, scientists have been trying for decades to optimize optics, measurement strategy or build multi-detector systems to take advantage of every possible neutron to measure weaker fluctuations on smaller samples.

Our approach tackles the problem from the other end. The goal of **ALSA** is to increase the sample size for inelastic neuron experiments. It will fully automatize the co-alignment process by using a state-of-the-art X-Ray Laue diffractometer, robotized manipulators, real-time camera recognition and special software analysis for crystal placing. The device **ALSA** will be a true game changer in the field of inelastic neutron scattering, because it will drastically speed-up sample preparation.

In my presentation, I will focus on the design of the device, the possible use of artificial intelligence, and discuss a newly developed online 2D irregular bin packing problem with limited rotations used for crystal placement.

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