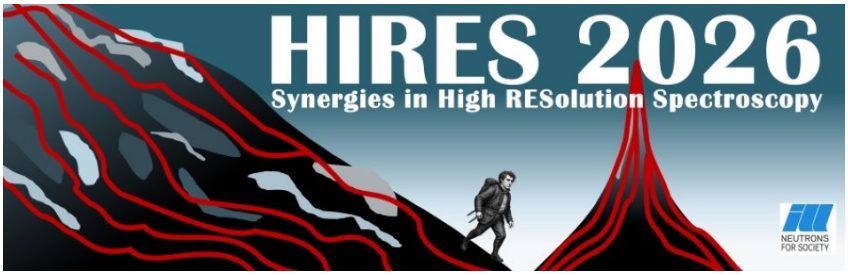

Contribution ID: **18** Type: **Poster**

Following the dark-recovery process of the pP-SB1-LOV protein with neutron backscattering spectroscopy.

Light is an important stimulus for many biological processes. While structural changes in photo-responsive proteins are studied using well-established techniques, the implications of dynamic transitions during the photo-switching process remain to be assessed. High-resolution neutron backscattering spectroscopy enables the study of protein dynamics on the pico- to nanosecond timescale.

In this contribution, the photocycle of the pP-SB1-LOV protein is investigated using neutron backscattering spectroscopy on two instruments: the IRIS time-of-flight inverted-geometry crystal analyser and the IN16B high-resolution backscattering spectrometer.

Experiments were conducted initially with ex-situ illumination, and later with in-situ illumination, to observe the dynamics of the stationary dark-adapted and illuminated states. Comparisons are drawn between the quasi-elastic neutron scattering (QENS) observables and QENS observables derived from molecular dynamics simulations using the MDANSE software package of these stationary states. Further, the dynamic transitions along the dark-recovery process were observed by fixed window scans as well as continuous QENS spectra.

Resolving the dynamics of photo-responsive proteins throughout their photocycle within the constraints of a neutron backscattering experiment demands careful consideration of experimental design and data analysis framework, which will be continued in a long-term proposal aiming to develop pump-probe experiments at IN16B.

Session

Biology/Health

Primary author: BOSSERHOFF, Theresa (JCNS-1 & ILL)

Co-authors: STADLER, Andreas (Forschungszentrum Jülich); Prof. ULLMANN, Matthias (University of Bayreuth); SEYDEL, Tilo (Institut Max von Laue - Paul Langevin); Prof. KRAUSS, Ulrich (University of Bayreuth)

Presenter: BOSSERHOFF, Theresa (JCNS-1 & ILL)

Session Classification: Biology/Health