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(Elastic) neutron scattering on hydrogen rich samples

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Estimating the resolution of instruments equals predicting their capabilities. Of course, those estimates are only that good as the assumed simplifications are justified. One of the most significant assumption for SANS or NR is, that they are solely elastic. In this context, the interaction of neutrons with hydrogen rich samples is of particular interest, especially due to numerous neutron scattering experiments investigating soft condensed matter. Without doubt, the contribution of elastic scattered neutrons is by far dominating. However, resolving scattering features, which require high signal to noise ratio or q-resolution, are limited by in- and or quasi-elastic scattered neutrons. The same circumstances might also restrict the significance of the outcome of commonly used contrast variation experiments, originated by the strong incoherent scattering length and fast dynamics of ^1H compared to deuterium. Here we will present SANS and NR experiments showing in-elastic / quasi-elastic scattering, partially compare them to spectroscopic investigations in the same scattering geometry and elaborate their impact on data quality.

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