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A McStas Simulation Framework for Nested Mirror Optics - Method and Applications

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The transport of neutrons from the region where they have been generated (e.g. a moderator) to the a sample or detector are a crucial part of neutronic experiments and instruments.

In course of the currently running EU project HighNESS a particular kind of these transport systems is being studied: nested mirror optics. These devices are assembled from several layers of neutron mirrors that are arranged in an elliptical or a Wolter optic geometry. The nested arrangement makes highly efficient and compact components possible. To run Monte Carlo simulations that quantify the performance as well as to find the best geometries of such devices a collection of Python methods was developed. With its help McStas components for the simulations can be generated automatically from a couple of input parameters.

I will present the capabilities of the library and the simulation framework used and show two application examples: i.e. the NNBAR experiment and an in-beam ultracold neutron (UCN) source.

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