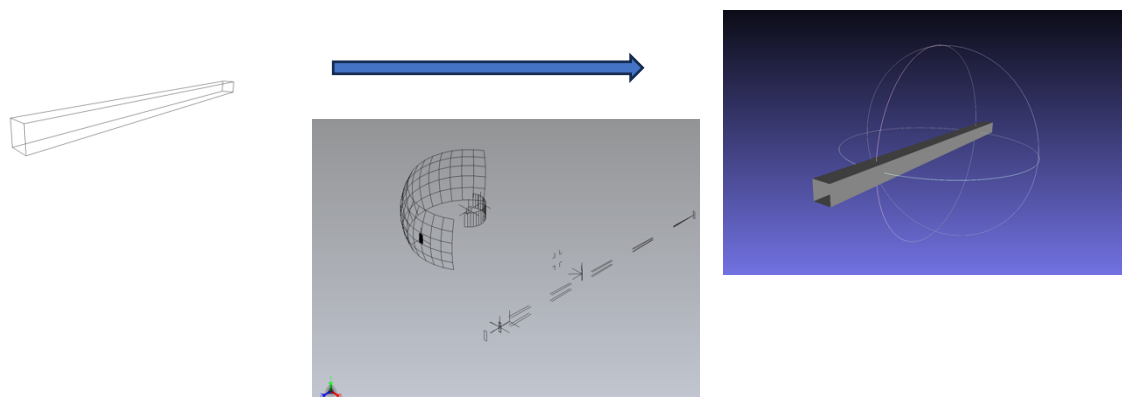


Help us improve 3D visualisation in McStas



Supervisor	?	Code difficulty	★★☆☆☆
Co supervisor	Peter Willendrup, peter.willendrup@ess.eu	Physics difficulty	★★☆☆☆

DESCRIPTION

Neutron scattering is an investigative technique that examines matter at the atomic scale, particularly the distances between atoms in crystals. This process involves placing a sample in a neutron beam. By analysing the scattering patterns of these neutrons, researchers can infer the sample's properties. Instruments used in these experiments are highly specialized for various types of samples and scattering methods.

The European Spallation Source, nearing completion in Lund, Sweden, houses 15 such instruments. These instruments have all leveraged Monte-Carlo ray-tracing for their design, a method that predicts performance in terms of neutron intensity on the sample and the resolution of detected signals. McStas is a popular software tool for this purpose and mainly developed in Denmark.

Most of our simulated material geometries are “simple”, i.e. cylinders, spheres or boxes, but there is an increasing interest in “CAD”-like geometries, however our visualisation system currently draws line-pieces and not “solids”. We would like to gradually introduce proper 3D rendering with shaded interfaces etc.

The project at hand will include a little work on core McStas visualisation, some work on a selected 3D visualisation tool and lots of modifications on the McStas component layer.

REQUIREMENTS

Experience with the Python and C programming languages

Knowledge of / interest in 3D-visualisation

LINKS

<https://www.mcstas.org>