2D Modeling for SANS Data

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Small Angle Scattering data is usually collected on a 2D position sensitive detector. Typically the material being studied is in solution where all objects are freely rotating thus producing a circularly symmetric pattern. This reduces the problem to 1D. However, as more and more complex systems are being investigated, and under an increasing number of external field conditions, that is becoming less and less true.

The main solution to date has been to take two orthogonal 1D cuts through the data and analyze them separately or attempt to quantify the anisotropy at a given Q. This however loses the richness of the 2D information collected.

The SANS subgroup of the DANSE project has recently begun to extend the 1D analytical models to analyze 2D data. The first model code has been successfully imported into the NCNR IGOR framework (figure 2) for alpha testing and debugging. This is the first example of DANSE code being incorporated into facility software and hints at the many benefits to the community of a close collaboration between the facility software teams and DANSE.

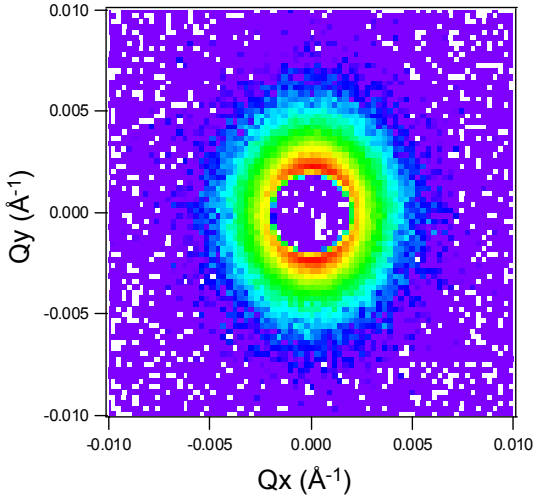

Figure 1. This data is part of a study of the structural origin of clot rheology, by D. Pozzo and L. Porcar.

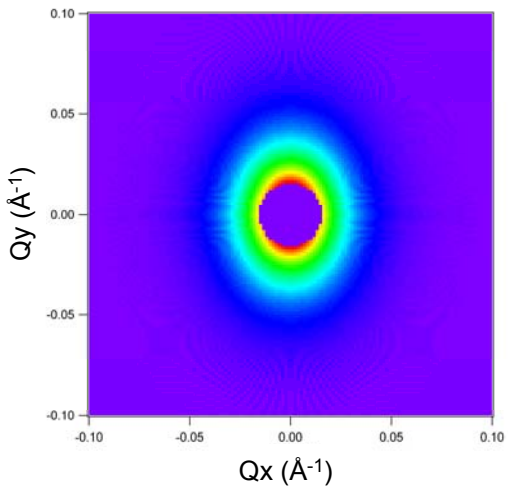

Figure 2. 2D simulation for a cylindrical model with angular dispersion.

Model:
Cylinders of L=8000Å, r=600Å, radius poly σ_r = 100Å.
The angular distribution σ_φ perpendicular to the beam axis was determined experimentally.