	Experiment title: Thermal Fluctuations on Surfaces of Complex Fluids	**Experiment number**: SI 789
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Shifts: 18	**Local contact(s)**: Bernd Struth	*Received at ESRF:*

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Report:

From the technical point of view, the proposed experiments worked very well. The curves we obtained from the diffuse scattering in grazing incidence diffraction geometry are very detailed and present a very good signal to noise ratio which is crucial for such kind of experiments.

We investigated two different types of samples:

1) By in plane scans of the diffusely scattered intensity of free and lipid covered gel surfaces we could show that the gelation process reduces and depresses parts of the capillary wave spectrum of such kinds of systems (Figure).

2) Another series of experiments showed that the roughness spectrum of standard polymer melts is strongly dependent on its viscosity and thus on the chain length.
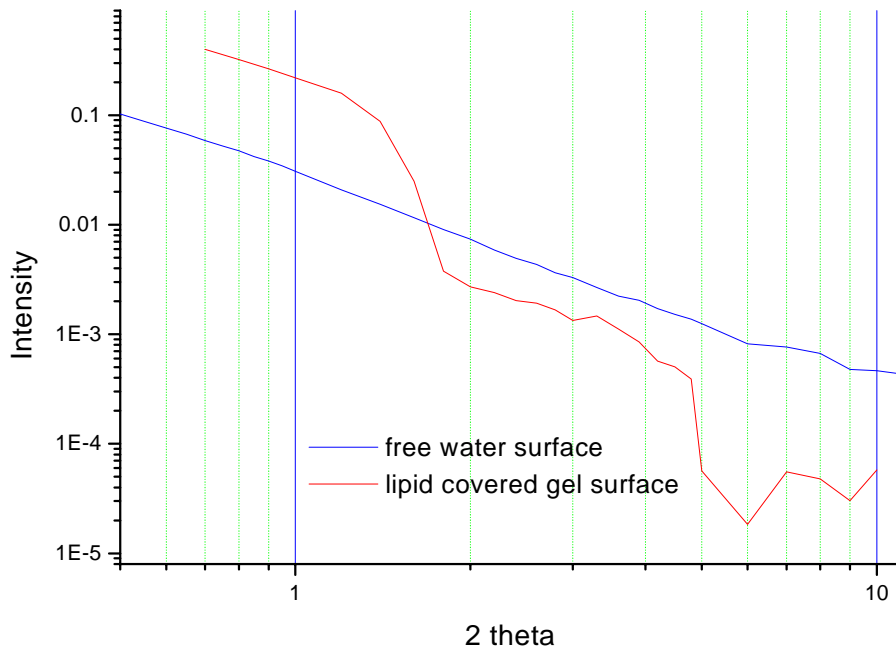
Figure: Diffuse scattering of the free water and the lipid covered gel surface. Two cut offs could be observed for the lipid covered gel surface that can be related to a decreased surface roughness.

For both systems, we could calculate roughness and surface tension parameters. For the gel system we could show that the roughness of the lipid covered gel surface seems to be lower at some length scales than even the roughness of the free water surface (~3.5 Å). For the moment we have no model to explain this length scale dependence of the surface roughness of the gel surface. We are working on an explanation.