ESRF	**Experiment title:** Directed Assembly of Colloidal Superballs	**Experiment number**: 26-02-871
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Shifts: 9	**Local contact(s)**: Michela Brunelli Daniel Hermida Merino	*Received at ESRF:*

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Report:

The objective of this experiment was to determine the effect of the shape and the size of colloidal silica superballs on their formation into colloidal monolayers assembled using the unidirectional rubbing method. Here the colloidal monolayers were prepared by simply rubbing the dried colloidal superballs on PDMS-coated substrates.

Examples of SAXS patterns from a tilting series of the assembled colloidal monolayers prepared from silica spheres and cubes are depicted in figure 1. The obtained data suggests that the colloidal silica spheres form crystalline hexagonal lattices, as evident from the well-defined hexagonal diffraction patterns. It can also be seen that the colloidal cubes assembled into cubic-like lattices, as evident from the more square peaks in the SAXS patterns.

In addition, it can be seen that, upon tilting the colloidal monolayers, the peaks not only shift to higher q-values in the corresponding directions, but also oscillate in intentensity due to the presence of maxima and minima in the form factor.

The intensity of several peaks from the SAXS patterns of the colloidal monolayer prepared from silica spheres (as seen in figure 1) are depicted as a function of the tilting angle in figure 2. Here it can clearly be seen that some peaks oscillate in intentensity.

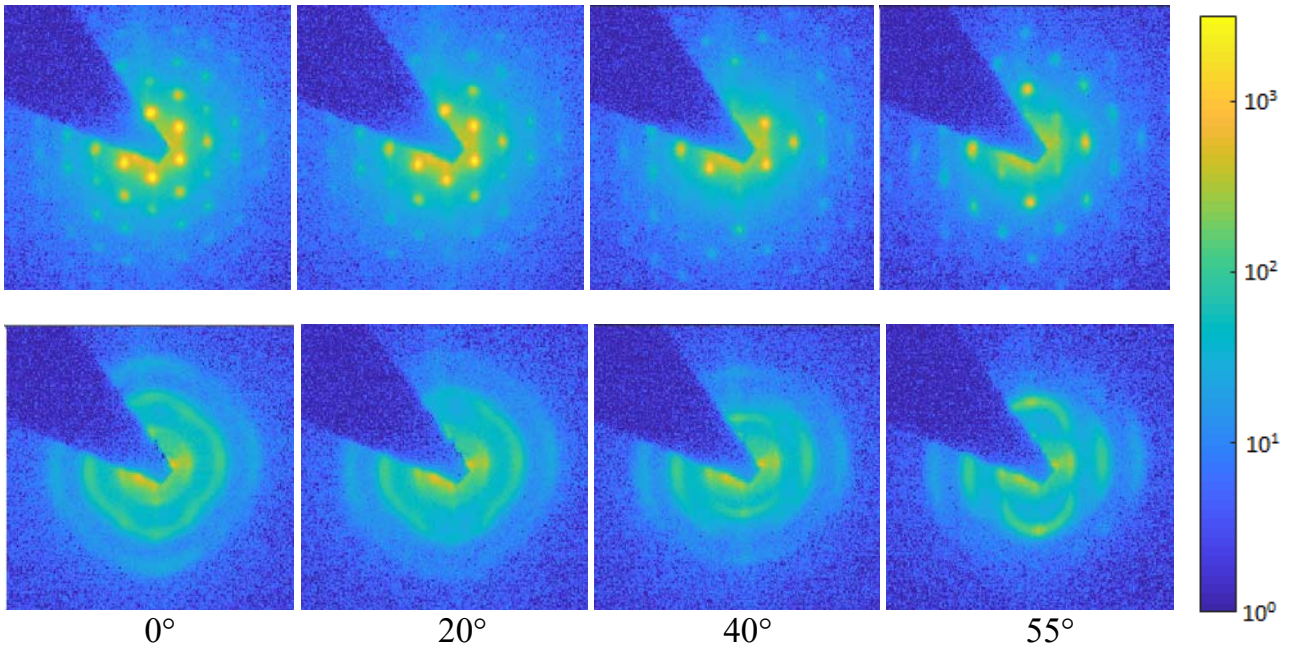

Figure 1: Examples of SAXS patterns from a tilting series of the assembled colloidal monolayers prepared from silica spheres (top row) and cubes (bottom row). Here, the background was subtracted and the data was plotted logarithmically.

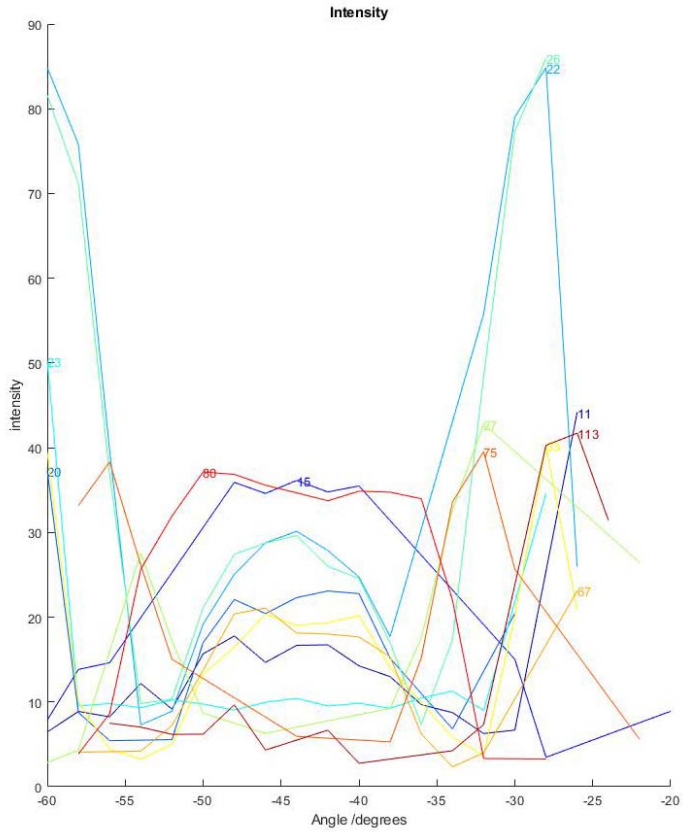

Figure 2: The intensity of several peaks from the SAXS patterns of the colloidal monolayer prepared from silica spheres as seen in figure 1 as a function of the tiling angle.

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