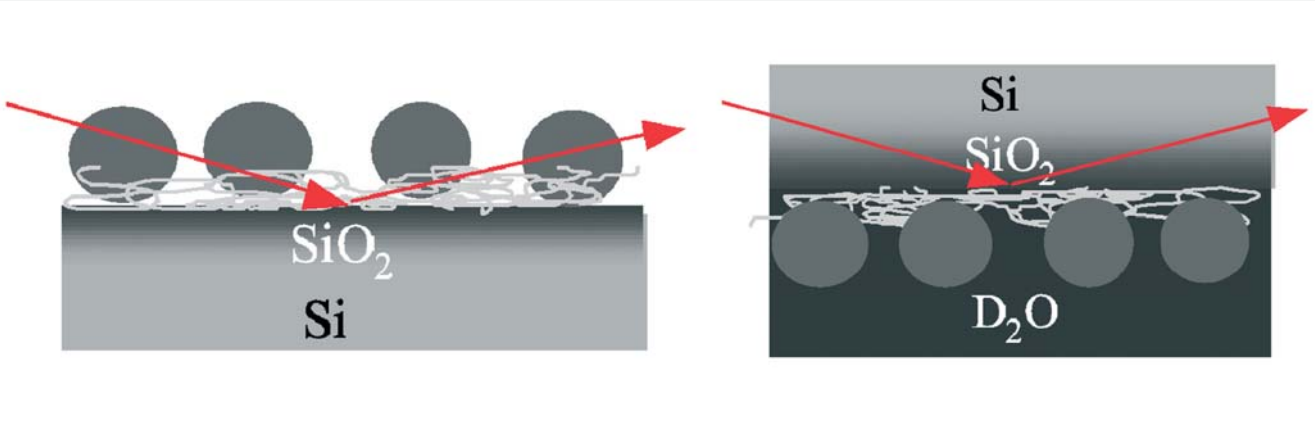
[*C13.* G. Chaboussant] **Study of absorbed nanoparticles at a solid-liquid interface by neutron surface scattering.**
Using neutron surface scattering techniques like grazing incidence neutron small angle neutron scattering (GISANS) and Specular Neutron Reflectivity (SNR) we have characterised the adsorption process of SiO_2 nanospheres (of radius 8-13 nm) at a silicon-water interface for different preparation process and chemical conditions. The silica nanospheres are dispersed in aqueous media and two different size of spheres have been tested. Prior to adsorption on the surface the spheres have been characterized in bulk solution by classical SANS and a classical extinctions of the form factor of spherical particles is observed. It reveals a very narrow size dispersion. In particular, it is possible to measure the lateral correlation length of a single layer of grafted beads and to derive information on the configuration of the grafted beads at the solid surface. GISANS measurements provide a clear cut answer through the measurement of the structure surface factor which is found to be reminiscent of a repulsive liquid, with correlation peaks coherent with the surface fraction obtain from SNR. The repulsion process between the spheres occurs during grafting. This is linked to the electrostatic process of adsorption on the negative spheres on the positively charged silicon wafer. Once a sphere has adsorbed on the surface, it locally inverses the charge surface and prevents adsorption of others spheres in its vicinity through electrostatic repulsions with a repulsion range dependent on the salinity but not on spheres radius. In effect, the surface electrical charges on the spheres prevent them from forming a dense adsorbed layer at the solid surface. The typical distance of the adsorbed beads is 50% larger than the diameter of the beads.
[Collaboration: F. Cousin, J. Jestin, G. Chaboussant, S. Gautrot, F. Ott (LLB)]



Left: Large spheres absorbed at the surface (air-solid interface). Right: Small spheres absorbed at the surface (solid-liquid interface). The greyscale corresponds to the scattering length density (SLD) of the species.