



Contribution ID : 107

Type : Invited speaker

## The beauty of contrast variation in SANS for soft matter : playing beyond classical studies in 4-components systems

Wednesday, 18 May 2022 15:30 (30)

We all learn in textbooks that contrast variation is a unique possibility that makes SANS so powerful to probe the “extraordinary structure of ordinary things” in soft matter. But there is a clear difference between reading it and experiencing it by itself. As for my part, I discovered it the very first time I came in Grenoble during my PhD when I tried to probe the structural organization of a few spherical magnetic particles dispersed in a sea of clay nanoparticles that I contrast-matched [1]. It was an unforgettable souvenir and this is in great part because I had the chance to have a young, very efficient and very friendly local contact that arrived just some months ago before at ILL: Isabelle! We did not know at that time that we'll become good friends later and that we'll meet so often, when either she was coming in Saclay, when I was coming in Grenoble and during schools we organized together.

Thus, later during my academic career, I tried to push the contrast variation method up to its limit by considering four-components systems. I will show that playing with contrast in such systems remains possible if the system is craftily designed with respect to neutrons, with three of the components having a close SLD, very different from those of the component to be characterized, or if two pairs of components have the same contrast. I will illustrate it by examples taken from representative systems of soft matter : nanocomposites made of polymeric melts reinforced by nanoparticles [2], colloidal suspensions of complexes polyelectrolyte and proteins of opposite charges [3,4], and foams [5].

1. F.Cousin et al, V, Langmuir, 2002, 18(5), 1466-1473; F.Cousin et al, Langmuir, 2008, 24(20), 11422-11430
2. A.-S. Robbes et al, Macromolecules, 2018, 51 (6), 2216–2226
3. J. Gummel et al, Macromolecules, 2008, 41(8), 2898-2907
4. J. Gummel et al, J. Am. Chem. Soc., 2007, 129(18), 5806-5807
5. A. Mikhailovskaya et al, Adv. in Coll. and Int. Science, 2017, 247, 444-453.

**Primary author(s) :** COUSIN, Fabrice (Laboratoire Léon Brillouin, CEA)

**Presenter(s) :** COUSIN, Fabrice (Laboratoire Léon Brillouin, CEA)

**Session Classification :** Talks