

PROBE THE ORGANIZATION OF LIQUID INTERFACES BY SECOND HARMONIC GENERATION

LABORATORY : Institut Lumière Matière

LEVEL : M1 / L3
TEAM(S) : LIQ@INT

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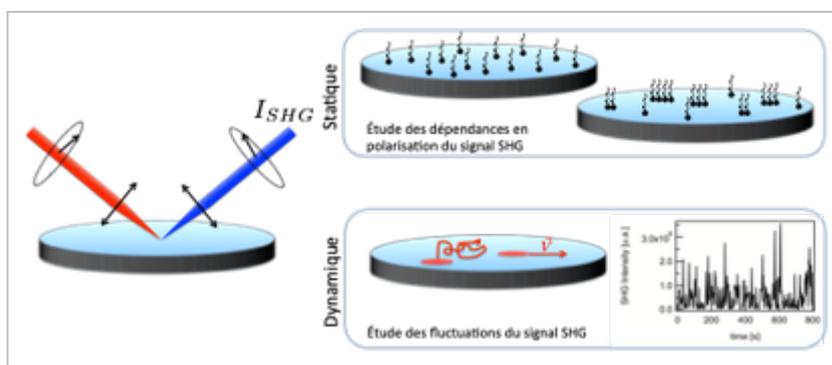
KEYWORD(S) : liquid-gas interfaces / non-linear optics / second harmonic generation

SCIENTIFIC CONTEXT :

Liquid interfaces play a central role in many situations in everyday life and in industry:

- foam stability
- nuclear waste extraction processes
- lubrication

Their properties, such as their composition or rheology, will determine the efficiency of the above processes. The "classic" techniques used in soft materials provide an indirect response to these interfaces, with contributions from the surrounding volume that are sometimes non-negligible.



During this internship, we propose to use non-linear optical techniques to study the properties of these interfaces. In particular, we will be using Second Harmonic Generation (SHG): for reasons of symmetry, this process is only possible at interfaces, making it a tool of choice for studying them without being hampered by volume responses. We will develop this technique and the associated analyses in order to determine the static properties (such as composition or organization) but also the dynamic properties (adsorption/desorption, diffusion on surfaces) of interfaces.

MISSIONS :

The internship will start with the study of a model system (e.g. stearic acid), which has the advantage of being easy to detect in SHG and of having well-documented behavior at interfaces. Depending on the progress made, the studies will then be extended to interfaces closer to the applications.

OUTLOOKS :