

Master 2 internship proposal

Physique et Mécanique des Milieux Hétérogènes

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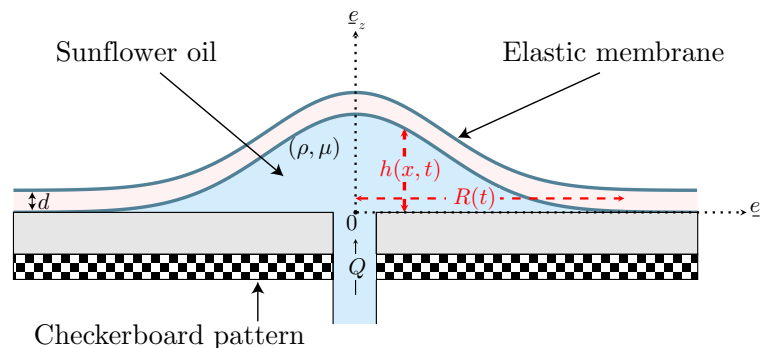
Internship location: Laboratoire PMMH

Laccoliths in the lab

Laccoliths are hills formed by intrusion of magma under deformable rock layers. Inspired by this geological system, we have studied the growth of liquid pockets under elastomeric membranes using a model system in the laboratory (see figure). The deformation fields are measured through the deformation of a checkerboard pattern placed below the experimental system.

Earlier work focused on the spreading and coalescence of such "elastic" drops, in a lubrication regime where the fluid layer remains very flat. We now wish to address new questions more closely related to the geologic inspiration system: i) What is the role of adhesion of the elastic layer to its support, and how does this affect the aspect ratio of the bump formed? ii) Can the covering membrane exhibit wrinkling when deformed?

We propose to explore experimentally and theoretically, at the laboratory scale, the formation and dynamics of these peculiar "drops".



A viscous liquid is injected under a deformable layer. The morphology of the resulting "bump", measured using the fast checkerboard demodulation technique, depends on the physical parameters of the liquid and solid membrane.

Expected skills: The project is mainly experimental, with minimal modeling of the observed phenomena. Image analysis will be performed. Numerical/Theoretical projects can complement the project.