**Modeling the low-inertia fluid-structure interactions of liquid-core microcapsules**

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Capsules consisting of a liquid droplet enclosed by a thin elastic membrane are commonly encountered in nature in the form of cells and in numerous industrial processes. The protection and controlled release of active agents is of great importance for diverse applications in the food, cosmetic, bioengineering and medical engineering industry among others. They necessitate having a good understanding of the capsule behavior under low-inertia flow conditions and controlling the membrane mechanical properties.

An overview will be given on how the three-dimensional fluid-structure interactions may be modeled in low inertial regimes. We will see how numerical simulations and microfluidic experimentations enrich one another and allow together to design techniques to characterize the viscoelastic properties of microcapsules, or to sort capsule/cell suspensions.