

Dynamics and rheology of cell and vesicles in shear flow

Tuesday, 27 September 2016 17:20 (20 minutes)

A deep understanding of the dynamics and rheology of suspensions of vesicles, cells, and capsules is relevant for different applications, ranging from soft glasses to blood flow [1].

I will present the study of suspensions of fluid vesicles by a combination of molecular dynamics and mesoscale hydrodynamics simulations (multi-particle collision dynamics)

in two dimensions [2], pointing out the big potential of the numerical method to address problems in soft matter. The flow behavior is studied as a function of the shear rate,

the volume fraction of vesicles, and the viscosity ratio between inside and outside fluids. Results are obtained for the interactions of two vesicles, the intrinsic viscosity of the suspension, and the cell-free layer near the walls [3-5].

[1] D. Barthes-Biesel, *Annu. Rev. Fluid Mech.* 48, 25 (2016)

[2] R. Finken, A. Lamura, U. Seifert, and G. Gompper, *Eur. Phys. J. E* 25, 309 (2008)

[3] A. Lamura and G. Gompper, *EPL* 102, 28004 (2013)

[4] A. Lamura and G. Gompper, *Procedia IUTAM* 16, 3 (2015)

[5] E. Afk, A. Lamura, and V. Steinberg, *EPL* 113, 38003 (2016)

Primary author: Dr LAMURA, Antonio (IAC CNR)

Presenter: Dr LAMURA, Antonio (IAC CNR)

Session Classification: Sessione 6