

Séminaire

Lundi 3 juin 2024 à 10h30
Amphithéâtre Henri Benoît

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Brownian motion of a soft nanoparticle near a lipid bilayer

Using mesoscopic numerical simulations, we investigated Brownian motion of a soft nanoparticle near a lipid bilayer. The nanoparticle consists of a polymer assembly in the form of a micelle and its size is 10 to 20 nm. Several independent simulations allowed to compute the micelle trajectories during an observation time smaller than the diffusive time scale (which order of magnitude is similar to the membrane relaxation time of the largest wavelengths), this time scale being hardly accessible by experiments. In that time range, the mean-square displacement exhibits different behavior along parallel and perpendicular directions. When the micelle is sufficiently close to the bilayer, its motion becomes quickly subdiffusive in the normal direction. Moreover, the temporal evolution of its MSD excess in the perpendicular direction follows that of a nanoparticle near an elastic membrane. However, in the parallel direction, the MSD excess is rather similar to that of a nanoparticle near a liquid interface. Independent numerical measurements of the nanoparticle mobility allowed to support those observations.

Les personnes souhaitant rencontrer M. Abbas sont priées de prendre contact avec Antonio Stocco.