Long-Range Interactions in Particulate Suspensions

전명석[1,2,†]
[1]한국과학기술연구원(KIST); [2]KIST School
(mschun@kist.re.kr[†])

Long-range interactions refer to the potential usually acting at a distance above 1 nm, consisting of hydrodynamic interactions and colloidal interactions. Hydrodynamic interactions result in the non-uniform flow field around a specific body due to disturbance by neighboring objects, and colloidal interactions are of physicochemical origin caused by electrostatics, van der Waals, and hydrophilicity/hydrophobicity. Understanding these interactions in particulate suspensions, i.e., the many-body system, is essential to accurately characterize their structural and dynamic properties or behavior. This presentation focuses on the aqueous particulate suspension in confined spaces such as microchannels and membrane pores. The partitioning of suspended colloids can be a remarkable problem, where it turns out that the effect of particle-particle and particle-wall interactions related to the repulsive energy is evident. The hindered diffusion for the dilute limit of charged suspension is predicted to decrease with increasing charged repulsion for a given confinement. The last part of my talk plans to introduce some of numerical schemes and platforms in open reported in this research field.