

Analysis of the effective viscosity of dilute suspensions

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We are interested in the effective viscosity generated by a large number of small rigid particles immersed in a Stokes flow. When the volume fraction ϕ of the particles is small, a first order approximation of the effective viscosity is provided by Einstein's formula : $\mu_{eff} = \mu + \frac{5}{2}\phi\mu$. We will discuss in this talk the second order approximation, for which pair interaction must be taken into account. We will show how the mathematical approach developed by S. Serfaty and co-authors on Coulomb gases can be applied, providing explicit formula. This is a joint work with M. Hillairet.