
KI-AHM LEE,

Homogenization of Soft inclusions

In this talk, we are going to discuss the soft inclusions of periodically distributed materials with periodicity ϵ . We call soft inclusion when the diffusion coefficient is zero on the included subset. Since the diffusion coefficient is nonzero outside of inclusions, there will be an effective diffusion when the periodicity ϵ goes to zero. The corresponding equation considered at this talk will be a fully nonlinear equation in the perforated domain with Neumann data on the boundary of inclusions. The effective equation will be obtained by constructing global periodic solutions called correctors. On the other hand, it is not clear what the compatibility condition for the nonlinear equation with Neumann data. So we introduce the concept of the first corrector to find the compatibility condition and the second corrector to average out the oscillations. When the compatibility condition violated, the effect of Neumann data will dominate. So we consider smaller inclusions so that the effect from diffusion and the influence of Neumann data are balanced.