

Homogenization of the brush problem with a source term in L^1

ANTONIO GAUDIELLO, OLIVIER GUIBÉ, FRANÇOIS MURAT

Affiliation: Università degli Studi di Cassino e del Lazio Meridionale, Cassino, Italy

email: gaudiell@unina.it

We consider a brush composed of cylindrical vertical teeth distributed over a fixed basis. All the teeth have a similar fixed height and a cross section of diameter less than a small parameter ε , and their asymptotic density is bounded from below away from zero. Let us note that the diameters of the teeth can be of different orders, and that their distribution is not assumed to satisfy any type of periodicity. In this domain we study the asymptotic behavior, as ε tends to zero, of a second order elliptic equation with a zeroth order term which is bounded from below away from zero, with homogeneous Neumann boundary condition, and with an L^1 source term. Working in the framework of renormalized solutions, and introducing a notion of renormalized solution for some type of degenerated elliptic equations, we identify the limit problem and prove a corrector result.