Homogenized equations of the linear elasticity theory in two-dimensional domains with interfaces highly oscillating between two circles

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Abstract: The main purpose of the present paper is to find homogenized equations in explicit form of the theory of linear elasticity in a two-dimensional domain with an interface rapidly oscillating between two concentric circles. In order to do that, we use the equations of linear elasticity in polar coordinates, and write them and the continuity conditions on the interface in matrix form. By standard techniques of the homogenization method, we have derived the explicit homogenized equations and associate continuity conditions for isotropic and orthotropic materials. Since the obtained homogenized equations are explicit, i.e. their coefficients are expressed explicitly in terms of given material and interface parameters, they are useful in practical applications. ?? 2010 Springer-Verlag.

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