

homogenization for composites with embedded multioriented ellipsoidal inclusions (Article) ([Open Access](#))

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Abstract

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An analysis of wave propagation in the low-frequency domain using the self-consistent medium method (SCM) for a composite with randomly distributed ellipsoidal inclusions embedded in a matrix is studied. The constituents of which may have transversally isotropic properties. An extension of the SCM method proposed by Sabina et al. (1993) for transversally isotropic composites with several types of inclusions (different geometrical shapes and materials) is given. In that sense, the influence of the various geometrical forms of the inclusions in both, static and dynamic regimen, is analyzed. Quasi-longitudinal and quasi-transversal waves are considered as a function of the direction of incident wave. Some comparisons with previous results using the same method but considering only one type of ellipsoidal inclusions are excellent. Comparison with finite element calculations and two scale asymptotic homogenization method shows excellent results also. Dynamic effective properties, that is, dispersion and attenuation, for composites with different aspect ratios, and inclusion volume fractions are also shown. © 2015 Elsevier Ltd.

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