A generalized self-consistent method for estimating effective shear properties of unidirectional composites comprising cylindrical orthotropic constituents

Minhat, M. , Zuhudi, N.Z.M., Shamsudin, M.H., Isa, M.D., Harun, M.K

Abstract

A micromechanics model based on generalized self-consistent method is proposed to estimate shear elastic properties of unidirectional fibre composites comprising cylindrical orthotropic layers. The features of the generalized self-consistent method are briefly presented and the homogenization schemes in determining the effective shear moduli of transversely isotropic medium are demonstrated. Numerical examples on the prediction of axial and transverse shear moduli of polymer composite reinforced with nanostructure hybrid fibres are illustrated. The close agreement between the prediction results and the results obtained from the available experimental data and finite element study validates the solutions produced by the proposed model. © Published under licence by IOP Publishing Ltd.