

Development of an Elastic Functionally Graded Interphase Model for the Micromechanics Response of Composites

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Abstract : A new micromechanics framework is developed for long fibre reinforced composites using a single fibre surrounded by a functionally graded interphase and matrix as a representative unit cell. The unit cell is formulated to represent any number of aligned fibres by a single fibre. Using this model the elastic response of long fibre composites is predicted in all directions. The model is calibrated to experimental results and shows very good agreement in the elastic regime. The differences between the proposed model and existing models are discussed.

Keywords : computational mechanics, functionally graded interphase, long fibre composites, micromechanics

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