

TEMPLE UNIVERSITY
Department of Mathematics

Applied Mathematics and Scientific Computing Seminar

Room 617 Wachman Hall

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Links Between Effective Tensors of Fiber-Reinforced Elastic Composites

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Abstract.

Predicting the effective elasticity of a composite material based on the elasticity of the constituent materials is extremely difficult, even when we know a great deal about the microstructure of the composite. According to Hooke's Law, the linear elasticity of a material can be described by an elasticity tensor, which at each point in the material is represented by an element of $Sym(Sym(\mathbb{R}^3))$. Suppose $L(x)$ and $K(x)$ represent the elasticity at point x in two periodic composites. We call a relation between L and K a link if the effective tensors L^* and K^* derived from $L(x)$ and $K(x)$, respectively, also satisfy this relation. We focus on fiber-reinforced composites and use representation theory to study effective tensors.