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Meredith Hegg* (mhegg1@temple.edu), mhegg1@temple.edu. *Exact Results for Effective Tensors of Fiber-Reinforced Elastic Composites.*

Predicting the effective elasticity of a composite material based on the elasticity of the constituent materials is extremely difficult, even when the microstructure is known. However, there are special cases, called exact relations, where certain properties in the constituents will be maintained in the composite regardless of microstructure. In a related situation, sometimes two composites that have the same microstructure but different constituent materials will have related effective tensors. In this case we say that the tensors are linked. In this work we apply the general theory of exact relations and links to find all such results for polycrystalline fiber-reinforced elastic composites. (Received September 21, 2011)