Periodic and stochastic homogenization in linear elasticity

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In 1993, Giuseppe Geymonat, Stefan Müller and Nicolas Triantafyllidis demonstrated that, in the setting of linearized elasticity, a Γ-convergence result holds for highly oscillating sequences of elastic energies whose functional coercivity constant over the whole space is zero while the corresponding coercivity constant on the torus remains positive. We find sufficient conditions for such a situation to occur through a rigorous revisiting of a laminate construction given by Gutiérrez in 1999. We further demonstrate that isotropy prohibits such an occurrence.

The results apply to both the periodic and the stochastic setting. They were obtained in part with Marc Briane (Rennes), and in part with Antoine Gloria (Brussels) and Scott Armstrong (Paris).