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On the well-posedness of the linear peridynamic model and its convergence towards the Navier equation of linear elasticity. (English) [Zbl 1133.35098](#)

Commun. Math. Sci. 5, No. 4, 851-864 (2007).

Summary: The non-local peridynamic theory describes the displacement field of a continuous body by the initial-value problem for an integro-differential equation that does not include any spatial derivative. The non-locality is determined by the so-called peridynamic horizon δ which is the radius of interaction between material points taken into account

Well-posedness and structural properties of the peridynamic equation of motion are established for the linear case corresponding to small relative displacements. Moreover the limit behaviour as $\delta \rightarrow 0$ is studied.

MSC:

35Q72 Other PDE from mechanics (MSC2000)

45K05 Integro-partial differential equations

74B05 Classical linear elasticity

74H10 Analytic approximation of solutions (perturbation methods, asymptotic methods, series, etc.) of dynamical problems in solid mechanics

74H20 Existence of solutions of dynamical problems in solid mechanics

74H25 Uniqueness of solutions of dynamical problems in solid mechanics

Cited in **57** Documents

Keywords:

linear elasticity; non-local theory; peridynamic equation; Navier equation

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