Peridynamics and topology optimization

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Abstract

Peridynamics, introduced by Silling [1], is a new way of modelling non-local effects in elastic materials. The key point is that deformations are required just to be integrable, and no extra assumptions on the derivatives of deformations are imposed, so that natural nonlocal phenomena like fracture or cavitation are admitted by the model. In this talk, an introduction to peridynamics will be given, going from the peridynamics formulations of linear models to nonlinear (including hyperelastic) models [2]. The relation between peridynamics nonlocal models and local models will be also commented. Finally we will report on the possible applications of these models in optimal design and structural optimization problems, having in mind the recent relevant paper [3] where an interesting connection between sensitivity filtering and a nonlocal elasticity model has been shown.

References
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