FOURIER-BASED METHODS FOR COMPUTING THE BEHAVIOR OF HETEROGENEOUS MATERIALS: DEVELOPMENTS, EXTENSIONS AND APPLICATIONS.

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ABSTRACT

In recent years, a growing interest has been observed toward spectral "FFT-based" methods originally introduced in the 1990s for simulating the elastic response of heterogeneous materials. Contrary to standard finite element implementations, these dedicated methods:

- do not require any meshing procedure,
- are generally much more efficient from a computational viewpoint,
- are well-suited for a (massively) parallel implementation and
- are straightforward to implement.

In addition, they are applicable for various physics and consequently for multi-physics. The purpose of the mini-symposium is to promote discussion between researchers working on

- the method itself (algorithms, theoretical background),
- its extension in the fields of mechanics (i.e. dislocation mechanics, damage, non-local behaviors, interfaces, …),
- its extension to various physical domains,
- its application to various kinds of materials and properties,
- its implementation in High Performance Computing environments,
- the dialog between simulation results and experiments especially using computed tomography.