

Radial-Type Approximation Technique for a Space-Time Multiscale Computational Strategy

Anthony Nouy, Pierre Ladeveze

LMT-Cachan, France

A new multiscale computational strategy for the analysis of small disturbances of structures (such as composite structures) described in detail both in space and in time was introduced recently. This strategy is iterative and involves an automatic homogenization procedure in space as well as in time. At each iteration, this procedure requires the resolution of a large number of linear evolution equations, called the micro problems, on the micro scale. Here, we present a robust approximate resolution technique for these micro problems based on the concept of radial approximation. It consists in approximating the solution defined over the space-time domain by a sum of radial functions, each of which is the product of a scalar function of the time variable by a function of the space variable. This very general technique, which leads to the construction of a relevant reduced basis of space functions, is particularly suitable for the analysis of composite structures.

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