Mathematical Physics

Asymptotic Analysis and Synthesis in Mechanics of Solids and Nonlinear Dynamics

I. V. Andrianov, H. Topol

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In this lectures various methods which give a possibility to extend an area of applicability of perturbation series and hence to omit their local character are analysed. While applying asymptotic methods as a rule the following situation appears: the existence of asymptotics for $\ve\rightarrow 0$ implies an existence of the asymptotics for $\ve\rightarrow\infty$. Therefore, the idea to construct one function valid for the whole parameter interval for $\ve$ is very attractive. The construction of asymptotically equivalent functions possessing a known asymptotic behaviour for $\ve\rightarrow 0$ and $\ve\rightarrow \infty$ will be discussed. Using summation and interpolation procedures we focus on continuous models derived from a discrete micro-structure. Various continualization procedures that take the non-local interaction between variables of the discrete media into account are analysed.

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