Summary: The main objective in this work is to study an application of the B-spline approximations in the Least Squares Method recovery of the structural response for boundary value problems in some linear elastic systems. These responses were approximated before using polynomial bases in the Stochastic perturbation-based Boundary Element Method and now are replaced with second or third order B-spline functions. A majority of such an approach is that the resulting expected values and standard deviations of structural response are obtained using analytical calculus of probability integrals, so that neither statistical nor expansion methods are necessary. Numerical illustration delivered in this paper includes fundamental eigenfrequencies of elastic thin homogeneous and isotropic plate immersed into Newtonian fluid subjected to various boundary conditions at its external edges.

MSC:
74-XX Mechanics of deformable solids
76-XX Fluid mechanics

Keywords:
stochastic boundary element method; B-spline approximation; semi-analytical probabilistic technique

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