

# **RBF-based meshless method for the analysis of thin elastic plates undergoing large deflections**

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Abstract

A meshless method model based on radial basis functions (RBF) has been developed for the analysis of thin elastic plates undergoing large deflection. This is achieved by firstly developing a model for the problem of small deflection of elastic thin plates. The model is then utilized in carrying out a detailed parametric investigation to select the most practical RBF for pursuing the study, considering the effect of plate geometry, nodes distribution and intensities, under different practical boundary conditions and loading conditions. Consequently, the model is extended to the large deflection problem, which is represented by the coupled von Karman nonlinear partial differential equations, using the selected radial basis function. The large deflection model addresses two formulations based on two in-plane movement restraints, namely, movable and immovable edges. Finally, the proposed formulations are tested for their reliability through several numerical examples in comparison with readily available numerical and analytical solutions.