# Large Amplitude Vibration of Sandwich Beam

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**Abstract :** The large amplitude free vibration analysis of three-layered symmetric sandwich beams is carried out using two different approaches. The governing nonlinear partial differential equations of motion in free natural vibration are derived using Hamilton's principle. The formulation leads to two nonlinear partial differential equations that are coupled both in axial and binding deformations. In the first approach, the method of multiple scales is applied directly to the governing equation that is a nonlinear partial differential equation. In the second approach, we discretize the governing equation by using Galerkin's procedure and then apply the shooting method to the obtained ordinary differential equations. In order to check the validity of the solutions obtained by the two approaches, they are compared with the solutions obtained by two approaches; they are compared with the solutions obtained numerically by the finite difference method.