

## 축방향으로 이동하는 티모셴코보의 동특성 해석

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### Dynamics of an Axially Moving Timoshenko Beam

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**Key Words** : Moving Beam, Timoshenko Beam, Vibration, Spectral Element, Stability, Divergence, Flutter

**Abstract** : The use of frequency-dependent spectral element matrix (or exact dynamic stiffness matrix) in structural dynamics is known to provide very accurate solutions, while reducing the number of degrees-of-freedom to resolve the computational and cost problems. Thus, in the present paper, the spectral element model is formulated for the axially moving Timoshenko beam under a uniform axial tension. The high accuracy of the present spectral element is then verified by comparing its solutions with the conventional finite element solutions and exact analytical solutions. The effects of the moving speed and axial tension on the vibration characteristics, the dispersion relation, and the stability of a moving Timoshenko beam are analytically and numerically investigated.