A Modified Transfer Matrix Method for the Coupling Lateral and Torsional Vibrations of Asymmetric Rotor-Bearing Systems

謝勝終, 陳俊宏, 李安謙

Mechanical Engineering

Engineering

chen@chu.edu.tw

Abstract

For analyzing the coupled lateral and torsional vibrations of asymmetric rotor-bearing system, an extended transfer matrix extended from one of the symmetric system is developed. Rather than the conventional "lumped system", the asymmetric rotating shaft is modeled by the Timoshenko beam in a continuous-system concept. According to our analysis, for the asymmetric isotropic rotor-bearing system, the synchronous lateral mode will split; moreover, there is a $2 \times$ lateral mode that does not appear on symmetric isotropic rotor-bearing systems.

Keyword：rotor-bearing,

lumped system,

transfer matrix,