

# **Dynamic Response of Rotor Bearing System Under the Effect of Residual Shaft Bow Mounted on Viscoelastic Suspensions**

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## **ABSTRACT**

The dynamic response of a rotor-bearing system mounted on viscoelastic suspensions is studied under the effects of the residual shaft bow and the disk unbalance. The influences of the disk eccentricity and disk-positioning between bearings on the dynamic response are also investigated. The system equation of motion is derived by the Lagrangian approach with the assume mode method. The dynamic characteristics, including system natural frequencies and steady-state responses, are determined. The results show that the resonance can be avoided from the range of working spin speed, and the unbalance response can be suppressed when certain viscoelastic stiffness is chosen for the system. The unbalance response can also be suppressed when a certain viscoelastic loss factor is chosen, if only the effect of residual shaft bow is considered in the system and the disk is positioned at the middle of the rotor. Thus larger resonance would occur at low spin speed unless the value of viscoelastic stiffness is big enough.