

# Dynamic and Thermal Behavior when AMB's (Active Magnetic Bearing) rotor drops onto the Catcher Bearing (Xiao Kang and Wan Zhong)

The catcher bearing (also known as an auxiliary, back-up or touchdown bearing) is designed to prevent the unexpected contact between the rotor and stator of the magnetic bearing in cases of overload or failure of the magnetic bearing. When AMB's rotor drops onto the catcher bearing, large heat and contact force will be generated. Here the high fidelity rotor drop model was established which considered both the dynamic and thermal behavior of the system so as to accurately simulate the drop event and predict the Catcher bearing life.

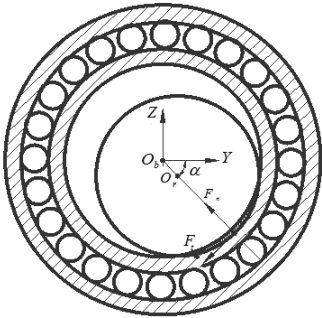


Fig. 1 The dynamic model of rotor drop

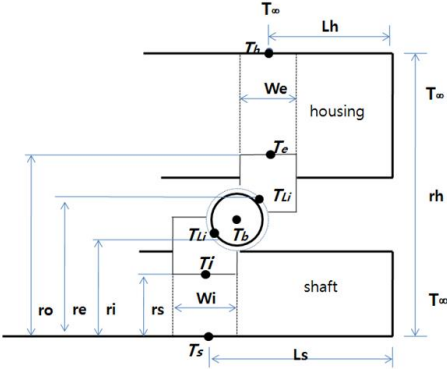


Fig. 2 Thermal Nodes

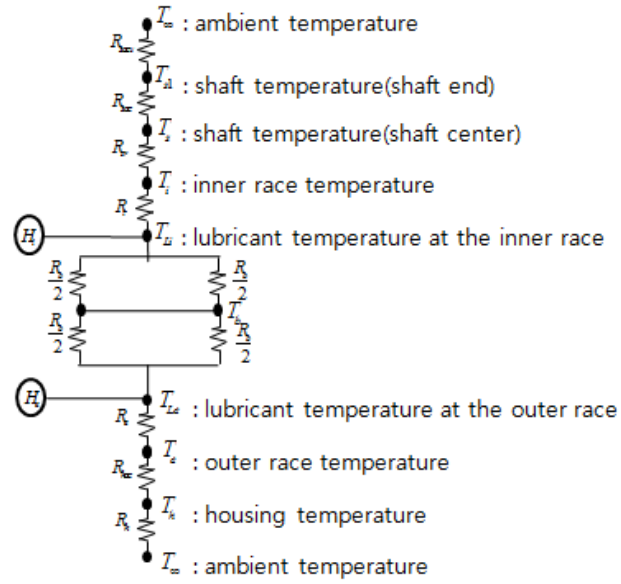


Fig. 3 Heat transfer network

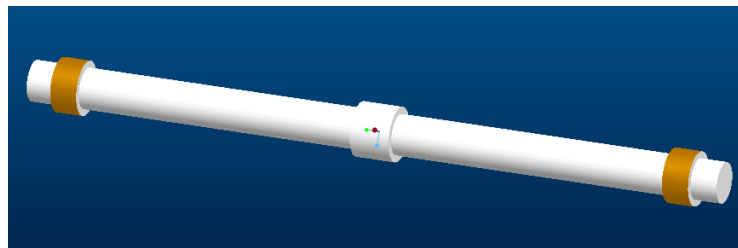
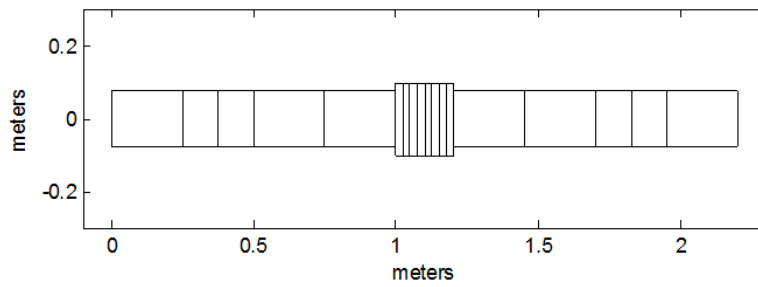


Fig. 4 Rotor model

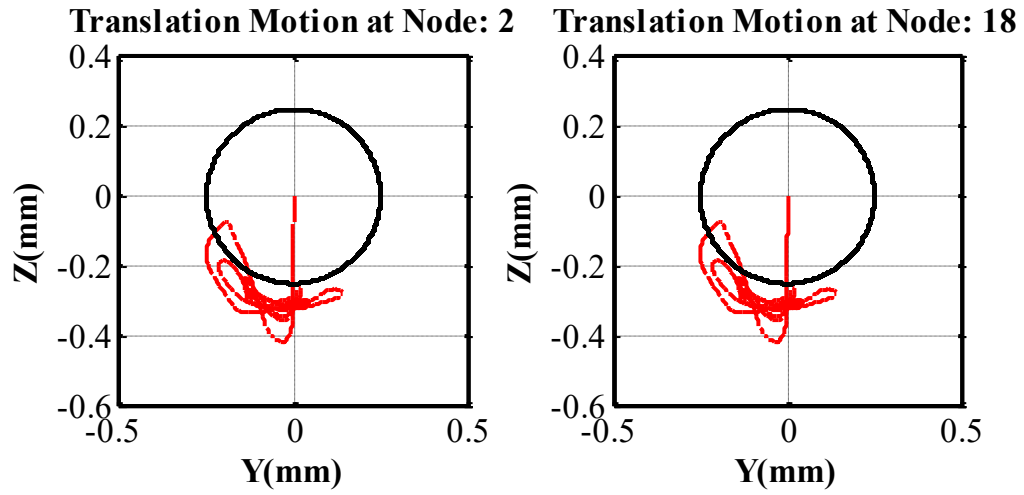


Fig. 5 Rotor center orbit when rotor drops onto the catcher bearing

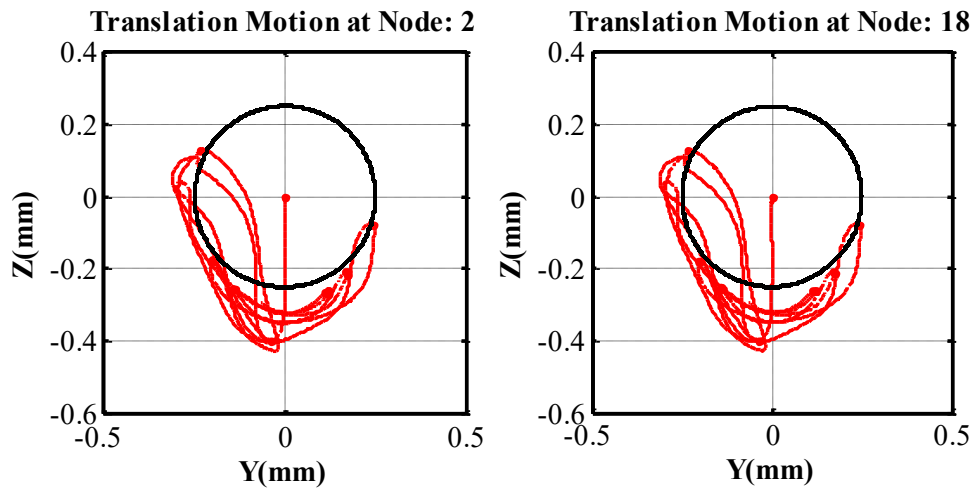


Fig. 6 Rotor center orbit when rotor drops onto the catcher bearing