

عنوان مقاله:

Visual Comparative Analysis for the Oil-air Two-Phase Flow of An Oil-Jet Lubricated Roller-Sliding Bearing

محل انتشار:

دوماهنامه مکانیک سیالات کاربردی, دوره 16, شماره 1 (سال: 1402)

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خلاصه مقاله:

To discuss the lubrication characteristics of roller-sliding bearing under oil-injected lubrication, the CFD method was introduced into the fluid-structure interaction model to realize the transient simulation of oil-air two-phase flow (OATPF). The volume of fluid (VOF) method is applied to capture the oil-air interface. A sliding mesh is established between the inner flow field and outer flow field. Moreover, the two design schemes of roller-sliding bearing are compared. A reasonable design scheme is obtained. The bearing rotation speed, oil velocity, oil viscosity, oil ratio, and oil temperature have a significant impact on the lubrication performance of the roller-sliding bearing. The results show that the oil distribution inside the bearing is uneven. The lowest oil volume fraction exists in the basin, which is near the upstream of the nozzle, and gradually increases from the inner raceway to outer raceway. The oil storing rate increases with the increase of oil viscosity. A novel method of oil volume prediction is proposed in a deep manner. It also provides some reference for the design of roller-sliding bearing and other bearings

کلمات کلیدی:

Roller-sliding bearing, Oil injection, Oil-air two-phase flow, Fluid distribution, CFD

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