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Composition du Jury

Civilité	Nom	Prénom	Grade / Qualité	Rôle
M.	SEABRA	Jorge	Professeur	Rapporteur
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Résumé

This thesis is dedicated to the study of large-size spinning contacts located at the interface between the roller-end and the flange in rolling-element bearings. The main goal of the study is to evaluate the influence of lubricant starvation on the film thickness distribution of the contact and analyze how spinning might affect this mechanism. Due to its importance in the reliability and performance of the bearings, the focus is set of the local minimum film thickness found at the low velocity region of the contact area. To tackle this problem, a dual numerical-experimental approach is proposed.

The film thickness distribution of spinning contacts is investigated numerically by means of a finite element model previously validated by two dedicated test rigs: Jerotrib and Tribogyr. The simulation of different operating, kinematic, geometric and lubrication conditions enables to write an analytic expression for predicting the aforementioned critical film thickness. At the same time, novel techniques to experimentally induce and control starvation in the contact are implemented into both test rigs and their results are contrasted with those of the simulation. It is demonstrated that the effects of spinning and starvation add up, so that the film thickness distribution of the spinning contact remains asymmetric but tends to a more Hertzian, and therefore thinner, distribution when limiting the oil supply upstream of the contact's inlet.