

PhD opportunity within the agreement "*Advanced Bearing Lubrication*" funded by SKF and hosted by INSAVALOR

Large-size spinning lubricated contacts

Context and objectives

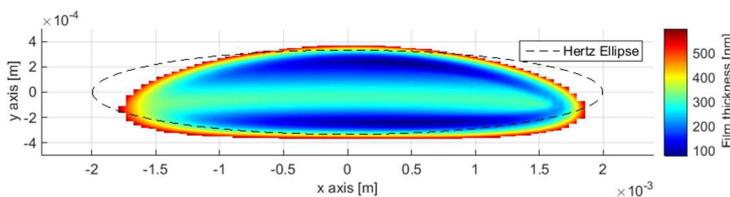


The study concerns the lubrication of large-size spinning thermo-elastohydrodynamic contacts, as those found in the flange – roller-end contacts in roller bearings. They are characterized by their large dimensions and radii of curvature, by the contribution of several velocity components, by the intense power dissipated within the conjunction and by severe operating conditions. All these features make difficult the operation of such contacts and underline the need for improving our understanding for a better prediction of their response.



Subject and program

The work will cover both experimental and numerical aspects in approximately equal proportions. The experimental part, carried out with a state-of-the-art test-rig [1], will include friction and lubricant film thickness measurements. To get closer to reality, the project aims to study, for instance but not limited to, the influence of lubricant starvation and the effect of the contact geometry.



In parallel, the existing multi physics FEM model [2] of large-size lubricated spinning contacts will be further developed according to the themes reported just before and to include new features like, for instance, the consideration of very mild contact pressures.

This double experimental & numerical approach allows a quantitative exploration of lubrication mechanisms (film thickness, friction, thermal dissipation) in presence of spin while being close to the actual working conditions.

Profile and conditions

The successful candidate holds a Master or Engineer degree in either mechanical engineering, physics or material science. He/she must show both adequate skills and motivations for numerical models. English as well as French should be currently read, written and spoken.

The folder includes: CV, motivation letter, recommendation letter, marks and ranking (Master's degree), name and contact information of 2 or 3 referees.

This thesis is part of the SKF-INSAVALOR Agreement "*Advanced bearing Lubrication*" and will be held at the Laboratoire de Mécanique des Contacts et des Structures (LaMCoS, INSA Lyon - CNRS UMR5259). The student will be jointly supervised by researchers from LaMCoS and SKF. He/she will interact with engineers from SKF. Beginning of the contract: as soon as possible.

Contacts

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[1] T. Doki-Thonon, PhD thesis, INSA Lyon, July 2012

[2] J.-D. Wheeler, The lubrication of non-circular spinning contacts, PhD underway