

# Non-isothermal Lubrication Problem with Tresca law. Existence and the behavior of weak solutions

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## Abstract

We consider a problem describing the motion of an incompressible, non-isothermal, and non-Newtonian fluid in a three-dimensional domain. We first establish an existence result for weak solutions of this problem. Then we study the asymptotic analysis when one dimension of the fluid domain tends to zero. A specific weak Reynolds equation, the limit of Tresca fluid-solid boundary conditions, and the limit boundary conditions for the temperature are obtained. The uniqueness result for the limit problem is also proved.