Abstract

The hydrodynamic lubrication interest is still of great importance, so that more and more elaborated lubricants are considered. They, however, involve consequently more and more hydrodynamic complexity as a result of the rheological properties of the additives. In our case, we consider lubricants having viscoelastic properties described by a generalized Maxwell model used in the case of journal bearing lubrication. The complexity of the coupled associated equations (momentum and constitutive) to describe the hydrodynamic prevailing in such a geometry requires numerical solutions. Using the commercial Finite Volume software Fluent 6.3 together with an appropriate developed computational code, via UDF (User Defined Functions), we determine the pressure distribution as well as the flow velocity profile and the stress field in the core, the load bearing capacity developed and the attitude angle; all together with the effects of the viscoelastic lubricant parameters (relaxation time and shear viscosity)