Abstract

In the present work, a reduced-order method, "Proper Generalized Decomposition (PGD)" is extended and applied to the resolution of the Reynolds equation describing the behavior of the lubricant in hydrodynamic journal bearing. The PGD model is employed to solve the characteristic 'Reynolds' partial differential equation using the separation technique through the alternating direction strategy. The resulting separated-dimension system has a low computation cost compared to classical finite-difference resolution. Several numerical benchmark examples are investigated to verify the validity and accuracy of the proposed method. It has been found that numerical results obtained by the PGD method can achieve an improved convergence rate with a very low computation cost.