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# NUMERICAL MODELLING FOR TRIBOLOGICAL PERFORMANCE OF ROUGH ELLEPTIC BORE JOURNAL BEARING

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## ABSTRACT

A journal bearing with elliptic bore is simulated for the tribological performance. The bore roughness of isotropic texture is characterized through expectancy model. Numerical modeling carried out by finite difference method adopting time marching steps of error convergences through effective influence Newton-Raphson method. The journal eccentricity ratio is considered low (ε=0.3), medium (ε=0.6) and high (ε=0.8) and non-circularity of bearing bore is quantified as (G=0.5, 1.0, and 2.0) for this analysis. The results are studied for short(β=0.5), finite(β=1.0) and long (β=2.0) journal bearing with two different roughness values (y=0.1, y=0.2). The result shows a good agreement with available research data. With increasing eccentricity, load carrying capacity increases for short-finite-long bearing, further provision of roughness develops more hydrodynamic pressure and reduce the friction force in all cases.

**Keywords:** Journal bearing; Elliptic bore; load carrying capacity; friction force; flow-in; side leakage