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Existence and uniqueness for nonlinear Reynolds equations. (English) Zbl 0624.76090
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The pressure distribution in a gas-lubricated bearing is given by the nonlinear Reynolds equation with the boundary value problem $\nabla \cdot (H^3 P \nabla P) = \Lambda(HP)_x$ in Ω , $P = G$ on $\partial\Omega$. Various results of existence and uniqueness for this equation are presented. Furthermore the system of nonlinear equations arising when elastic deformation of the bearing surfaces is not neglected is discussed.

MSC:

76N20 Boundary-layer theory for compressible fluids and gas dynamics
76N15 Gas dynamics, general
35Q99 Partial differential equations of mathematical physics and other areas of application

Cited in **6** Documents

Keywords:

a priori bound; pressure distribution; gas-lubricated bearing; nonlinear Reynolds equation; boundary value problem; existence; uniqueness; elastic deformation

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