Durany, J.; **Vázquez, C.**

Mathematical analysis of an elastohydrodynamic lubrication problem with cavitation. (English) Zbl 0841.35133

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Summary: A second-order nonlinear elliptic boundary value problem with discontinuous coefficients arising in elastohydrodynamic lubrication is studied. Physically, it corresponds to a two-dimensional model of the contact between an elastic rolling ball and a plane lubricated by a thin fluid film, when the viscosity is assumed to be constant. The model of Elrod-Adams is introduced in order to take into account the phenomenon of cavitation. A result of existence is obtained by means of regularization and fixed point techniques.

MSC:

35R35	Free boundary problems for PDEs
35J60	Nonlinear elliptic equations
35J25	Boundary value problems for second-order elliptic equations
74A55	Theories of friction (tribology)
74M15	Contact in solid mechanics

Keywords:

regularization; fixed point techniques

Full Text: DOI