

SEMINARIO DE ANÁLISIS Y APLICACIONES

Viernes, 24 de febrero de 2012

11:30 h., Módulo 17 (antiguo C-XV) - Aula 520 (Depto. Matemáticas UAM)

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Cavitation in solids and the regularity of
inverses for elastic deformations

Resumen: *Joint work with D. Henao.*

In Solid Mechanics, cavitation is the name given to the process of sudden formation of voids in a nonlinearly elastic material subject to a triaxial tension. This process is typical in near-incompressible solids, such as rubber or ductile metals.

In this talk, I will present a mathematical model for this phenomenon, as well as an existence theory based on global minimization of energy. Apart from the usual tools of the Calculus of variations (such as compactness, polyconvexity and lower semicontinuity arguments) we will use degree theory and distributional determinant to define mathematically a "hole" in the material.

In the last part of the talk, we will apply the techniques mentioned above to solve a seemingly unrelated problem: is the inverse of a Sobolev invertible map also Sobolev?