

Report 2005/2006 ER 'MULTIMAT' (505226) at
CMAP, Ecole Polytechnique, Palaiseau (France)
by Alessandro Ferriero

Background

I obtained a PhD in mathematics at the University of Milano-Bicocca in 2004. I worked on existence and regularity problems in the Calculus of Variations.

Research activity

The propagation of fractures in a solid undergoing to cyclic loadings is known as *fatigue*. During the one year ER 'MULTIMAT' position at the CMAP, Ecole Polytechnique (France), 02/01,2005 - 01/31,2006, we studied a time continuous model for fatigue, in the special situation of the debonding of thin layers, coming from a time discretized version proposed by A. Joubert and J.-J. Marigo ('L'approche variationnelle de la fatigue: des premiers résultats', C. R. Mecanique 333, 550-556, 2005). Under very general assumptions on the surface energy density and on the applied displacement, we proved the well-posedness of our formulation and we furnished the main properties of the evolution process.

Conferences

2005:

28/09 - 01/10, First annual MULTIMAT Meeting, Barcelona, Spain;

28/08 - 05/09, PDE, Optimal Design and Numerics, Benasque, Spain;

24/06 - 02/07, Calculus of Variations and PDE (L. Ambrosio, L.C. Evans, L. Caffarelli, G. Dal Maso, M. Crandall, N. Fusco), Cetraro, Italy;

11-15/04, A short course on level set methods (G. Allaire), Madrid, Spain;

14-16/03, II MULTIMAT Meeting, Paris, France.

Publications

A. Ferriero, 'Quasi-static evolution for fatigue debonding', submitted to ESAIM Control Optim. Calc. Var.