

Core-Radius Approximation of Singular Minimizers in Nonlinear Elasticity

Marco Bresciani

Johannes Kepler University Linz, Austria
MARCO.BRESCIANI@JKU.AT

Abstract

We study a variational model in nonlinear elasticity allowing for cavitation which penalizes both the volume and the perimeter of the cavities. Specifically, we investigate the approximation of the energy (in the sense of Γ -convergence) by means of functionals defined on perforated domains. Perforations are introduced at flaw points where singularities are expected and, hence, the corresponding deformations do not exhibit cavitation. Notably, those points are not prescribed but rather selected by the variational principle. Our analysis is motivated by the numerical simulation of cavitation and extends previous results on models which solely accounted for elastic energy without contributions related to the formation of cavities.

The talk is based on joint work with Manuel Friedrich (JKU Linz)

References

- [1] M. Bresciani, M. Friedrich. *Core-radius approximation of singular minimizers in nonlinear elasticity*. Applied Mathematics & Optimization (2026) 93:21.