

# Regularity of Mumford-Shah minimizers at the crack-tip

Hayk Mikayelyan

## Abstract

We consider the Mumford-Shah functional in the plane and study the asymptotics of the solution near the crack-tip. This problem arises in certain models of fracture mechanics. It is well-known that the leading term in the asymptotics at the crack-tip is related to the stress intensity factor. We calculate the higher order terms in the asymptotic expansion, and show that those are related to the curvature of the crack close to the tip. Moreover, we derive a new Euler-Lagrange condition for the minimizers. We also develop a new numerical method to compute the minimizers.

(Joint work with John Andersson and Zhilin Li)

(Two talks will be delivered in this topic)