On the convergence of critical points of the Ambrosio-Tortorelli functional

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In order to describe the behaviour of an elastic material undergoing fracture we can use a variational model and the so-called Mumford-Shah energy defined on a subspace of SBV functions. One difficulty is that the critical points of this energy are difficult to approximate by numerical methods. One can then think of approximating the Mumford-Shah energy by another energy defined on a space of more regular functions (H^1-functions) : the Ambrosio-Tortorelli energy. It is known since the pioneer work of Ambrosio-Tortorelli that the minimizers of this energy converge towards minimisers of the Mumford-Shah energy. In this talk we will show that, under an assumption of convergence of the energies, critical points of the Ambrosio-Tortorelli energy also converge to critical points of the Mumford-Shah energy.

Acknowledgment : this is a joint work with Jean-François Babadjian (Université Paris-Saclay, jean-françois.babdjian@universite-paris-saclay.fr) and Vincent Millot (Université Paris-Est Créteil, vincent.millot@u-pec.fr).