

UNDERSTANDING “PHASE–FIELD” MODELS OF FRACTURE.

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Abstract. Nearly 20 years after its inception, the variational approach to fracture has been the center of intense developments, and numerical implementations through “phase–field” approximations are increasingly popular. In this talk, we propose to revisit the links between brittle fracture and “phase–field” numerical models, leveraging recent progress in the understanding of gradient damage models. We will present a framework consisting of several simple problems focussing respectively on propagation law, nucleation, activation, and path identification, their analysis and numerical experiments. We will highlight how this framework can be used to gain a better understanding of the properties of various “phase–field” based approaches.