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# Visco-energetic solutions for a model of crack growth in brittle materials

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**Abstract.** Visco-energetic solutions have been recently advanced as a new solution concept for rate-independent systems, alternative to energetic solutions/ quasistatic evolutions and balanced viscosity solutions. In the spirit of this novel concept, we revisit the analysis of the variational model proposed by Francfort and Marigo for the quasi-static crack growth in brittle materials, in the case of antiplane shear. In this context, visco-energetic solutions can be constructed by perturbing the time incremental scheme for quasistatic evolutions by means of a viscous correction inspired by the term introduced by Almgren, Taylor, and Wang in the study of mean curvature flows. With our main result we prove the existence of a visco-energetic solution with a given initial crack. We also show that, if the cracks have a finite number of tips evolving smoothly on a given time interval, visco-energetic solutions comply with Griffith's criterion.

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