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**Interface debonding models: A viscous regularization with a limited rate dependence.**

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Summary: Interface models have been developed over the past 10 years for simulating various scales of composite debonding effects, such as decohesion between matrix and fibers and delamination in laminates, formulated with and without rate dependence. Here we give several examples of how sudden “solution jumps” can occur in rate-independent models like the Tvergaard one, depending on the geometry, interface behavior, and finite element discretization. This kind of instability disappears for often-used viscous models, but the result is a high rate dependence that deviate from experimental trends. We propose a new kind of viscous regularization, which applies to Tvergaard debonding model or to modified ones, and has a limited rate dependence. A few simple examples are given, including the delamination of a double cantilever beam, to show the capabilities of the technique proposed.

**MSC:**

[74R99](#) Fracture and damage

[74E30](#) Composite and mixture properties

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**Keywords:**

[interface debonding models](#); [viscous regularization](#); [Tvergaard debonding model](#); [limited rate dependence](#)

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