

## Toward Convergence in Initially Rigid Cohesive Fracture Models

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We analyze the convergence of finite element methods for cohesive fracture. The focus is on generalized fracture in which finding the crack path or paths is part of the solution process. Initially rigid cohesive models, in which interface elements are inactive until a critical traction is attained, are usually preferred in this context. We show that convergence as the time-step tends to zero is erratic or nonexistent unless the model satisfies a property called time continuity. We also argue that convergence as the spatial mesh size tends to zero is unlikely unless the mesh is able to represent all possible crack paths without preferred directions. We propose a method to achieve this kind of mesh isotropy in two dimensions based on Radin's pinwheel tiling. The pinwheel tiling in the limit can approximate any plane curve with the correct length.

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