Dynamic crack propagation in composite shell based on XFEM

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ABSTRACT

The industrial need for modelling crack propagation of some critical parts becomes of main interest in crash simulations, and generally in dynamic nonlinear simulations. A phantom-node method, based on X-FEM, has been developed for composite shell elements to describe cracks within the explicit scheme. The proposed method is implemented for one-point integration shell element with physical hourglass stabilization. The method is available in RADIOSS Explicit, which is on top of the industrial FE codes which are used for crash simulation since several years, as well as in other application fields such as fluid structure interaction or stamping simulation. A numerical example of crack propagations within composite shells is presented.

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