Numerical Modeling Of Microcracked Interfaces/interphases And Some Applications

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Abstract

Interfaces (e.g. contacting surfaces) and interphases (e.g. material thin layers) between solids are preferential zones of damage initiation and propagation. Modeling the microcracking phenomenon localized at the interfaces and interphases becomes crucial in many engineering applications such as adhesive bonding, composite structures, assemblies, etc. to predict the global structural behavior. The proposed numerical method consists in modeling microcracked interfaces/interphases as non-linear spring-like interface laws. The development of these constitutive laws and their implementation in the COMSOL Multiphysics® environment are illustrated. Some applications are also presented and discussed.