

Modeling Fiber Reinforced Composites with a Generalized Finite Element Method

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ABSTRACT

The accurate prediction of material properties calls for modeling approaches which can accurately describe specific microstructural features. When modeling fiber reinforced composites, the discrete representation of fibers is undoubtedly one of the basic requirements to represent the local kinematics which determines the global composite behavior. Traditional approaches are limited in their applicability to realistic fiber composites because of the high computational demands –meshing individual fibers at the adequate resolution is a prohibitive task. In this contribution, a generalized finite element method for the modeling of discrete fibers in composites [1] is reviewed and compared to other discrete fiber models. Thanks to special enrichment functions, this approach allows to accurately model individual fibers. An extension of the approach to rigid line inclusions [2] is discussed.

REFERENCES

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