

## ABSTRACT

Analysis of cracking localization using specially treated smeared crack finite elements is considered in this study. In the consideration of the cracking localization, it is more suitable to have an energy expression written in terms of discrete irreversible variables, which allow differentiation of the energy expression with respect to those irreversible variables. This implies that the discrete crack approach should be more appropriate for this kind of analysis than the smeared crack approach. However, the discrete crack approach may not be suitable for problems with many cracks, which are unavoidable for the analysis of the cracking localization. To avoid the drawbacks in both approaches, a special treatment on the smeared crack approach to allow the consideration of the cracking localization is developed. To this end, a discrete irreversible variable related to crack strain is introduced, and the cracking localization is considered, based on this discrete irreversible variable.