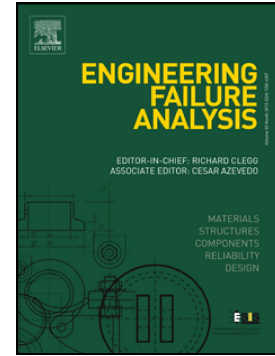


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**The failure processes analysis of rock slope using numerical modelling techniques**

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Abstract: The slope failure process includes crack initiation, propagation and coalescence during the formation of a slip surface (small deformation stage) and block movement, rotation and fragmentation during the sliding process (large deformation stage). Neither the finite element method (FEM) nor the discontinuous deformation analysis method (DDA) can solve such problems satisfactorily due to the complex mechanical behaviour of slope failure. To study the entire process of slope failure, we develop here a model that combines the FEM and DDA approaches. The main concept of this approach is to first apply FEM to model crack growth behaviour and then automatically switch to the DDA module to model the post-failure process when the slip surface forms. The efficiency and simplicity of this approach lies in keeping the FEM and DDA algorithms separate and solving each equation individually. The heterogeneous nature of the slope material at the mesoscopic level is considered by assuming that the mechanical properties of individual elements follow a Weibull statistical distribution.

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