

Finite element modeling of a tunnel affected by dislocation of faults

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Many tunnels built in mountainous areas go through active faults whose dislocation can severely affect the stability, strength and serviceability of the tunnels. In this study, the finite element method is used to simulate the dislocation of faults, and investigate the effects of the main factors such as the fault dip angle and the tunnel segment length on the internal stress and deformation of lining structures of a tunnel. The failure mechanism of the lining structures is studied, and the sensitivity of the main factors is analysed. It is found that the optimal segment length of the tunnel is 5m.

Keywords: Finite element method, Tunnels through faults, Lining structures, Dislocation of faults, Internal stress, Deformation.