

3. A New Evaluation Method on Tunnel Excavation Processes by Means of Dissipation Energy Analysis

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The instability due to rapid unloading of the initial rock pressure in case of blasting a tunnel through rock mass is analyzed statically by taking the excavation-induced energy into consideration. The released energy, named dissipation energy, causes the rock vibration in the vicinity of the tunnel face, and so is possible to have adverse effects upon the surrounding rock mass. Therefore it is preferable to minimize the dissipation energy in order to preserve the rock mass from loosening. The some numerical results show that the amount of dissipation energy is a good measure for the evaluation of excavation processes during tunneling.

Key words: tunnel excavation, rapid unloading, dissipation energy minimization, tunneling procedure evaluation, finite element analysis