

# EVALUATION OF STRENGTHENING LOCALIZED CRACKING OF TUNNEL LINING WITH STRAIN HARDENING CEMENTITIOUS COMPOSITES

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The lining cracking of mountain tunnel has always been a common engineering disease in traffic engineering, and the structural instability and leakage of tunnel caused by lining cracking seriously threaten the safety of tunnel operation. In this article, the strain hardening cementitious composites (SHCCs) characterized by the excellent deformation resistance and large energy absorption capacity is utilized to strengthen the cracked lining. Initially, the details of reinforcing lining process with SHCCs is introduced through a project. Moreover, the reinforcement effect is evaluated with relative stiffness  $K$  function based on three parameters: thickness of reinforcement layer  $h_2$ , concrete damage factor  $d_1$ , and strain hysteresis factor  $d_2$ . The results obtained by employing a simplified tunnel reinforcement model show that in the case where the lining damage state  $d_1$  is equal, as the thickness of the reinforcement layer  $h_2$  increases, the  $K$  value also increases. And when the value of  $d_1$  decreases, the growth rate of  $K$  increases. The strain hysteresis factor  $d_2$  also has an important influence on  $K$  value, and the results demonstrates that as  $d_2$  value increases, however, the  $K$  value show an opposite trend. Combining with the project example and evaluation system, it is suggested that the SHCCs can be exploited to strengthen the damaged tunnel lining, and the present engineering experience can provide some reference for similar tunnel lining required to be rehabilitated.

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