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钢纤维喷射混凝土支护抗常规爆炸震塌能力研究

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摘要 采用一维震塌模型，运用拉应力累积损伤破坏准则，分析常规爆炸作用下坑道震塌剥落条件，针对钢纤维喷射混凝土支护，结合现行有关规范，推导出震塌剥落层速度的实用计算方法，并运用数值模拟手段对计算结果进行验证，通过钢纤维喷射混凝土支护坑道的震塌剥落层速度与其他支护类型及毛洞的震塌剥落层速度对比，量化说明钢纤维喷射混凝土支护抗爆炸震塌的能力。

关键词 爆炸力学 震塌 钢纤维喷射混凝土 坑道支护 数值模拟

分类号

STUDY ON SPALLING RESISTANCE PERFORMANCE OF STEEL FIBER SHOTCRETE INDUCED BY CONVENTIONAL EXPLOSIONS

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Abstract

According to the failure criterion of cumulating damage and one-dimensional spalling model，the condition of collapse induced by conventional explosion has been analyzed. According to correlative standards，the practical calculation method is achieved aiming at the steel fiber shotcrete support used in tunnel. The comparison between the calculated result and the numerical one shows that the calculation method is valid. In order to illuminate the resistance performance of steel fiber shotcrete induced by the conventional explosion quantitatively，the velocities of rockfalls from the top of tunnel supported by steel fiber shotcrete are compared with that of the tunnel supported by other kinds of support and that of the tunnel without support. The practical calculation methods offered can provide some references for design of steel fiber shotcrete support in tunnel.

Key words explosion mechanics spallation steel fiber shotcrete tunnel support numerical simulation

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