

冲击地压机制的细观实验研究

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收稿日期 2006-11-20 修回日期 2007-1-11 网络版发布日期 2007-5-11 接受日期 2006-11-20

摘要 在国内外现有研究成果的基础上, 总结冲击地压发生特征, 结合我国最新冲击地压案例, 分析冲击地压的诱发因素。基于非平衡态热力学和耗散结构理论, 阐述冲击地压孕育过程中“煤体-围岩”系统内能量集聚及耗散特征; 同时, 研究煤体细观结构参数及有机组分分布等因素与煤体冲击倾向性的内在关系。通过煤样断裂过程的细观实验, 探讨煤岩体在采动等外界因素影响下内部微裂纹快速成核、贯通、扩展进而诱发煤体整体失稳的机制。

关键词 [采矿工程](#); [冲击地压](#); [细观结构](#); [冲击倾向性](#); [能量耗散](#)

分类号

INVESTIGATION ON MECHANISM OF COAL MINE BUMPS BASED ON MESOSCOPIC EXPERIMENTS

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Abstract

The investigation on the mechanism of coal mine bumps is always one of the hot topics in the field of mining engineering and rock mechanical study all over the world. Coal mine bumps, which may expel large amounts of coal and rock into the face area and cause damages to underground openings and equipments, are sudden failures near the mine entries. Persistent bump problems not only threaten the safety of mine works, but also have caused the abandonment of large coal reserves. Researchers have made a large efforts to understand, anticipate, and control this kind of hazard and have achieved lots of helpful results. The characteristics and induced factors of coal mine bumps are briefly described based on the investigation of recent bumps accidents happened in China. According to the theory of non-equilibrium thermodynamics and dissipation structure, the process of energy accumulation and dissipation in the coal-surrounding rock system is discussed during the propagation of coal mine bumps. Moreover, a series of experiments are conducted to analyze the relationship between bump-proneness and microstructural characteristics of coal. The process of coal mine bumps induced by propagation of fractures and deterioration of coal mass properties are also analyzed systematically.

Key words [mining engineering](#); [coal mine bumps](#); [microstructure](#); [bump proneness](#); [energy dissipation](#)

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