

论文

岩石破裂电磁辐射 (EMR) 现象实验研究

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收稿日期 2007-1-10 修回日期 2007-4-20 网络版发布日期 接受日期

摘要 岩石破裂电磁辐射现象是客观存在的物理现象.随着电磁辐射观测技术在地震研究、冲击矿压预测等领域的应用,极大地推动了岩石破裂电磁辐射的实验研究.本文对岩石破裂电磁辐射的影响因素以及相伴生的现象,以及有关的物理解释进行了概括介绍.由于不同研究者使用实验设计、实验参数、实验条件的不同,使得观测和研究结果同样难以统一认识.不同的研究者根据各自的试验提出了不同的物理机制.同时对已发现现象的重复性、证实性研究岩石试验缺乏.严重匮乏利用数值模拟以及建立模型定量研究岩石破裂的电磁辐射.此外,岩样实验系统不同于实际的地震系统,进行模拟震源环境的实验研究,发展大尺度的标本和原岩现场实验的基础上,如何建立室内室外岩石实验与地震观测事实之间的联系是问题的关键.

关键词 [岩石破裂](#) [电磁辐射](#) [物理机制](#)

分类号

DOI:

**Experimental and theoretical investigations of electromagnetic radiation induced by rock fracture**

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Received 2007-1-10 Revised 2007-4-20 Online Accepted

**Abstract** The phenomena of electromagnetic radiation(EMR) during fracture of rocks is a fact. With the applying in earthquake forest and monitoring rock and coal burst failure the investigation of EMR is developed greatly. The paper reviews the signal characteristics and the effect factors. The mechanism of EMR in rock friction is analyzed by far. Phenomenon observed and research results are difficult because of the distinction of experimental design, parameter and condition. Therefore various mechanisms are proposed. In the future, Experiment must be done for validating the results of the previous ones. Meanwhile we must quantify electromagnetic radiation of synthesis models. In addition, specimen experiment is different from a true earthquake. So big scale specimen or field experiment is developed greatly in order to simulating the environment of earthquake. Of course the relation of rock experiment and earthquake is the key to problem.

**Key words** [rock fracture](#); [electromagnetic radiation](#); [physical mechanism](#)

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