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## 基于三分向台站波形的重复地下爆炸相关检测

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Cross-correlation detection of repeating underground explosions using three-component stations

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摘要

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**摘要** 在将相关检测方法应用于三分向台站记录数据时不能采用台阵数据检测时所使用的基于相关系数束慢度估计的虚假触发筛查方法来控制误检测。为此, 本文根据重复事件的震中位置本身固定, 各台站记录到的重复事件信号之间的到时差与相应参考事件的信号到时差基本相同的特性, 根据两个以上三分向台站的相关检测触发到时差筛查相关检测虚假触发, 从而解决了相关检测方法在应用于三分向台站数据时虚假触发过多的问题。利用新疆的三个三分向台站一个月的连续数据对该方法进行测试的结果表明, 该方法能在接近零误检率的情况下对重复地下爆炸进行检测。

**关键词:** 三分向台站 重复地下爆炸 相关检测

**Abstract:** The false detection can't be eliminated with the slowness estimation method of the array data cross-correlation detection when the detection method is applied to three-component station records. Due to the fixed epicenter of the repeated events, the arrival time differences of repeated events between different stations are equal to that of the template event. The false detections are screened out based on the triggering time difference conditions of template event between different three-component stations. This cross-correlation detection method overcomes the problem of high false-alarm rate for the detection of three-component station records. We have tested this method with mining blasts in Qitai County, Xinjiang, China using continuous records of three 3-component stations. The results obtained show that very high detection rate for blasts close to the template event can be achieved without false alarming.

**Keywords:** Three-component station Repeating underground explosion Cross-correlation detection

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