

Microseismic monitoring for open pit slope stability and rock fall detection

X. Luo, M. Elmoultie, Y. Duan and P. Dean

CSIRO Mineral, Pullenvale 4069, Australia. Email: xun.luo@csiro.au

Keywords: Microseismic monitoring, open pit mining, slope stability, rock fall

ABSTRACT

Slope instability is one of the major concerns in open pit mining operation. A significant collapse of the pit wall can result in injuries, damages of machinery and interruptions to production. CSIRO has developed a broadband microseismic monitoring technique that can be used for diagnosing the healthy condition of a target slope area. This technique has been successfully applied to two open pit mines in Australia and Chile. Our research has found that this microseismic monitoring technique can be used in open pit for tracking and locating a falling rock that is rolling on slope if a dedicated seismic sensor network is established. In collaborating with other monitoring techniques (Radar, laser scan, aerial photography), more accurate determination of rock rolling trajectory can be obtained.

In this paper, examples of using the CSIRO microseismic monitoring technique at two open pit mines are presented. Results from an experiment of using the microseismic technique for degeneration of the trajectory of a rock falling on a slope are also presented.