Reyes-Montes, J.M., Sainsbury, B., Pettitt, W.S., Pierce, M. and Young, R.P. (2010) Microseismic tools for the analysis of the interaction between Open Pit and Underground Developments. ***Caving 2010: Proceedings of the Second International Symposium on Block and Sublevel Caving*****, Perth, Australia, p. 119-132, Y. Potvin, Ed. Perth: Australian Centre for Geomechanics.**

Microseismic tools for the analysis of the interaction between Open Pit and Underground Developments

Abstract

The transition from surface to underground mining presents a series of technical and operational challenges, in particular those arising from the interaction between the cave and the overlying pit. Seismic monitoring provides a unique means to obtain near real-time information about the development of the fracturing process induced by the mining operations. This paper presents the analysis of temporal, spatial and source size patterns in the seismicity recorded during undercutting and production at the Palabora Mine leading to slope failure in the open pit above, and relates these results to full-scale analysis of the rock mass behaviour in three-dimensional numerical models. Based on the application of the techniques described herein, it is shown that the back analysis of the seismic data provides a prediction technique that could now be employed during the planning stages of a mining operation. It is hoped that by employing these new techniques it would be possible to incorporate results from predicted fracture network behaviour into engineering designs in similar future mining operations and thus provide a means to predict and mitigate against large scale failure as observed at the Palabora Mine.

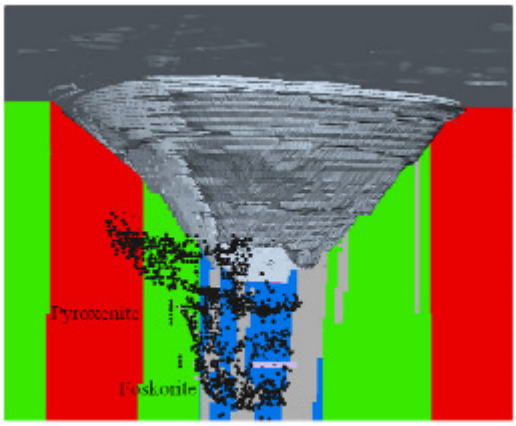

Figure*: Section looking east through north wall failure showing predicted seismicity around north wall failure and geomechanical domains.*

Website:
http://www.academia.edu/11825934/Microseismic_tools_for_the_analysis_of_the_interaction_between_open_pit_and_underground_developments

Please contact us (info@microseismic.net) for the details of the paper.