

Mine Seismology Workshop



20-22 October 2021, Kalgoorlie, WMC Conference Centre

Wednesday 20 October	09h00 – 17h00	Primer Course on the Basics of Mine Seismology, Vibration and Blast Monitoring		
Thursday 21 October	09h00 – 13h00	Presentations on Implementation and Applications of Seismic Monitoring in Mines terro Presentations on Geotechnical Applications of Distributed Acoustic Sensing (DAS) using Fibre Optic Cables		
	14h00 – 16h00			
	18h00	Dinner hosted by Institute of Mine Seismology		
Friday 22 October	09h00 – 17h00	Presentations on Mine Seismology and Training in IMS Software		

The registration fee is AUD 150 / day (incl. tea / coffee and lunch).

For more information and registration please visit IMS web site.

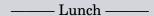
Wednesday 20 October - Day 1, Auditorium

Primer Course on the Basics of Mine Seismology, Vibration and Blast Monitoring

The objective of the course is to explain the elementary principles of seismic monitoring in mines, vibration and blast monitoring to non-seismologists.

09:00 | Basics of mine seismology, Dr Dmitriy Malovichko

Objectives of seismic monitoring in mines; seismic waves and seismic sources; seismic monitoring systems; location of seismic events; basic and derivative source parameters; source mechanisms; classification of seismic events; parameters of seismicity; analysis and interpretation of seismicity.



14:00 | Vibration and blast monitoring, Gareth Goldswain

Overview of the principles; differences between vibration monitoring and seismic monitoring in terms of objectives, sensors, instrumentation and applications; vibration monitoring for tailings dams; demonstration of xES (BlastMonitor), xPOD (tailings dam monitoring station) and data acquisition software.

Thursday 21 October - Day 2, Auditorium

Presentations on Implementation and Applications of Seismic Monitoring in Mines

09h00 | Welcome and Introduction

Dr Dmitriy Malovichko (Institute of Mine Seismology)

09h15 | Estimation of displacement and energy demand for burst resistant support design

Dr Peter K. Kaiser (GeoK & Professor Emeritus, Laurentian University) - on-line lecture

$09h45 \mid \mathbf{Crush\text{-type}}$ seismic events in mines: interpretation and utilisation

Dr Dmitriy Malovichko (Institute of Mine Seismology)

10h15 | Probing structural models of underground mines with seismic data

Dr Martin Gal & Stephen Meyer (Institute of Mine Seismology)

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11h00 | Recent improvements in routine processing of seismic data

Dr Martin Gal & Dr Ernest Lotter (Institute of Mine Seismology)

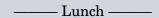
11h30 | Ground motion hazard and likelihood of shakedown damage

Dr Dmitriy Malovichko (Institute of Mine Seismology)

12h00 | Intergration of numerical stress modelling with seismic monitoring

Dr Dmitriy Malovichko (Institute of Mine Seismology)

12h30 | Session closure - discussion



Presentations on Geotechnical Applications of Distributed Acoustic Sensing (DAS) using Fibre Optic Cables

Terra15 and IMS are partnering to develop a fully-integrated monitoring system combining DAS and conventional sensors. The afternoon session is aimed at introducing and discussing DAS technology, specifically for seismic and geotechnical monitoring applications in mining.

14h00 | **Introduction to Distributed Acoustic Sensing**: fundamentals of fibre optic sensing and DAS; Terra 15's Treble DAS interrogator specifications and performance; DAS applications and solutions for mining

Dr Nader Issa (Terra15) - on-line presentation

14h40 | Using DAS for seismic monitoring in mines

Gareth Goldswain (Institute of Mine Seismology)

15h00 | Using DAS for mineral exploration and tailings dam monitoring

Gareth Goldswain (Institute of Mine Seismology)

15h30 | Session closure - discussion

Dinner hosted by the Institute of Mine Seismology

18h00 | Balcony Bar & Restaurant, Palace Hotel

Friday 22 October - Day 3, Room 2

Presentations on Mine Seismology and Training in IMS Software

There will be a combination of theoretical presentations and practical exercises explaining and illustrating the processing and interpretation of seismic monitoring data.

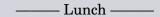
09h00 | What can go wrong in seismic monitoring, Dr Dmitriy Malovichko

- Problems with settings of seismic sites (coordinates, orientation, response) and their effect to data analysis.
- Issues with data acquisition and processing settings (array configuration, synchronization, velocity model, classification of events, source calculation parameters) and their effect on data analysis.

• How to detect problems in a catalogue of seismic events.

10h30 | Monitoring seismicity with IMS Ticker3D, Dr Martin Gal

- Live Viewer:
 - System health and management.
 - Viewing/managing seismic data.
 - STAT (re-entry) tool.
 - TARP automated tool for control room users.



14h00 | Source mechanisms from inversion to analysis in IMS Trace and IMS Vantage, Dr Martin Gal & Dr Dmitriy Malovichko

- Theory and requirements.
- Source mechanism inversion in IMS Trace.
- Quality control of source mechanisms.
- Utility of source mechanisms in IMS Vantage.

15h00 | Monitoring seismicity with IMS Ticker3D, Dr Martin Gal

- Long Term Analysis:
 - Viewing/managing long term seismic data.
 - Production data management, basic reports.
 - Sensitivity analysis.
 - Seismic plots.