


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
	14h00 – 16h00	 Presentations on Geotechnical Applications of Distributed Acoustic Sensing (DAS) using Fibre Optic Cables
	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.

———— Lunch ————

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 | **Crush-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)

———— Coffee/tea break ————

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**

———— Lunch ————

terra¹⁵ 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.

———— Lunch ————

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.