

Q3-2011 Newsletter

Introducing TechnoImaging

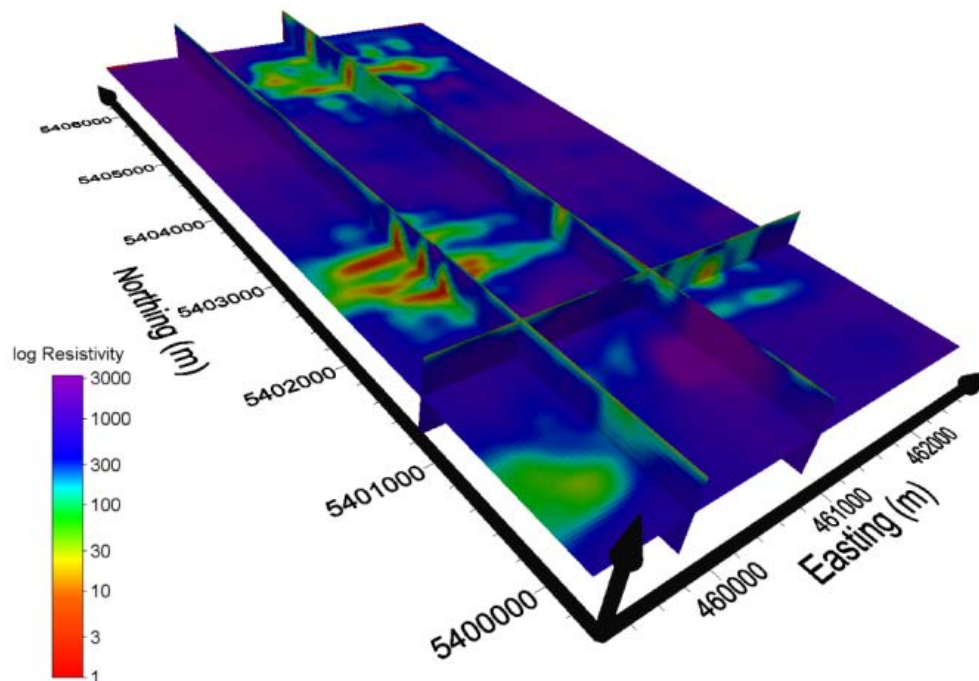
Founded in 2005 by Professor Michael S. Zhdanov as a spin-off from the University of Utah, TechnoImaging is an independent Salt Lake City-based company which provides commercial software products, inversion and interpretation services, contract research and development, and project management for all electromagnetic and potential field methods relevant to mineral exploration and environmental monitoring.

Mega-cell 3D AEM inversion

TechnoImaging offers the only 3D inversion for entire airborne electromagnetic surveys for any AEM system using its unique moving footprint approach. We are now routinely inverting entire AEM surveys up to several thousand line km in size to 3D conductivity models with up to tens of millions of cells.

Our 3D inversion can be applied to any AEM system, including DIGHEM, RESOLVE, GEOTEM, MEGATEM, TEMPEST, SPECTREM, VTEM, AEROTEM, and HELITEM.

TechnoImaging also provides 3D inversion for entire ZTEM and AirMt surveys.

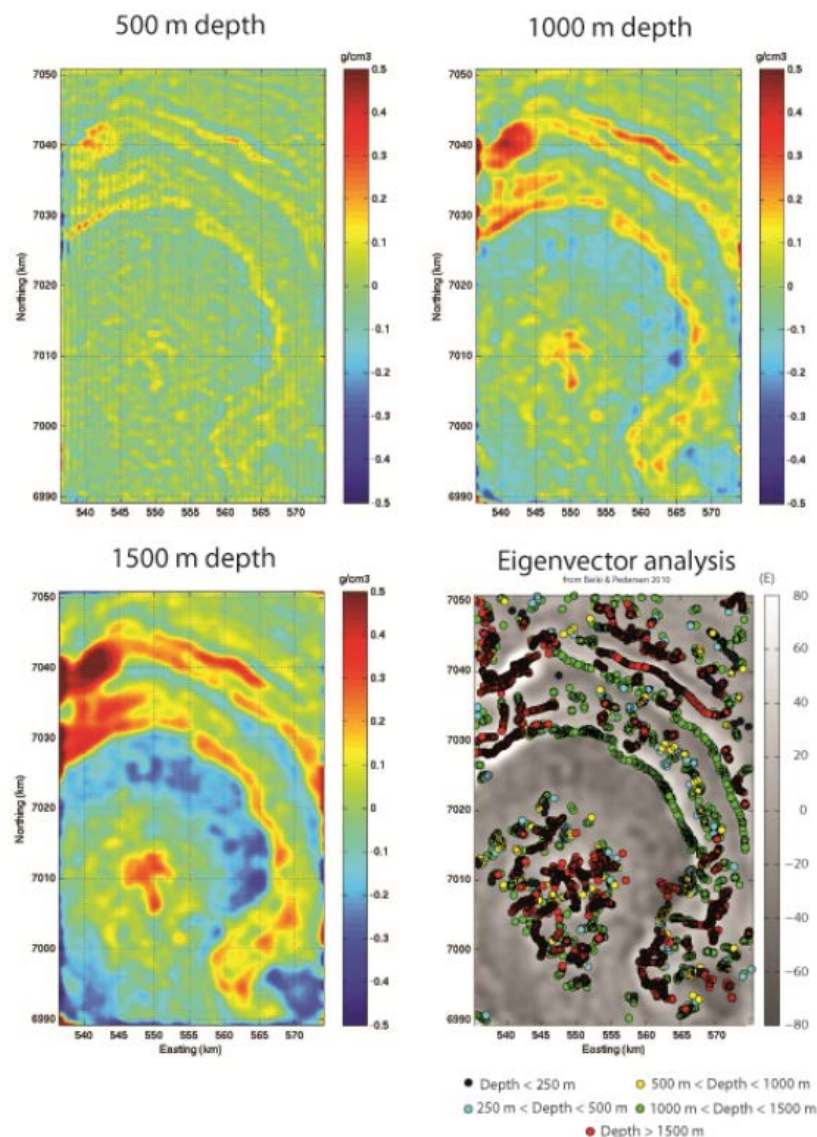


3D joint inversion of inline and vertical MEGATEM II dB/dt data from the Reid-Mahaffy test site, Ontario.

Breaking the billion cell barrier Giga-cell 3D potential field inversion

TechnoImaging offers the only massively parallel 3D inversion for gravity, gravity gradiometry, magnetics, and magnetic gradiometry. Our software is unprecedented in the unlimited scale of both survey and model that can be inverted – we are now routinely inverting entire surveys to mega- and giga-cell 3D density models.

With our focusing inversion, we are able to recover 3D models with sharper boundaries and higher contrasts than obtained by smooth inversion.



Horizontal cross sections of the 3D inversion of FALCON airborne gravity gradiometry data from Vredefort, South Africa, for 500 m, 1000 m, and 1500 m depth, with comparison to eigenvector analysis. The 3D density model was discretised to over 350 million 25 m cubic cells. Further details are described in [Wilson et al., 2011, Massively parallel 3D inversion of gravity and gravity gradiometry data, Preview.](#)

Web-hosted cluster computing services

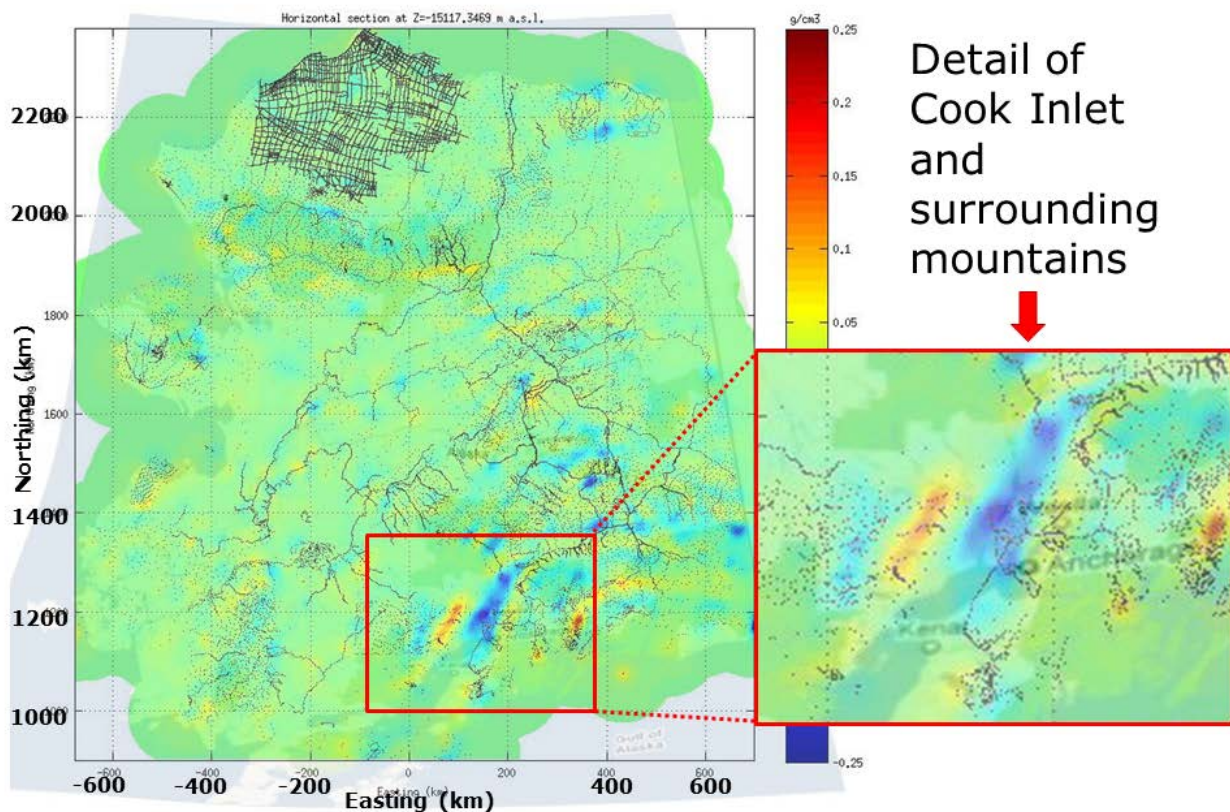
TechnoImaging offers web-hosted cluster computing services for access to TechnoImaging's software or for hosting client's proprietary software. Clients have secure access to TechnoImaging's cluster resources.

Non-exclusive 3D inversion products

TechnoImaging is developing a suite of non-exclusive 3D inversion products based on open file data.

At present, we have the following 3D models available for licensing:

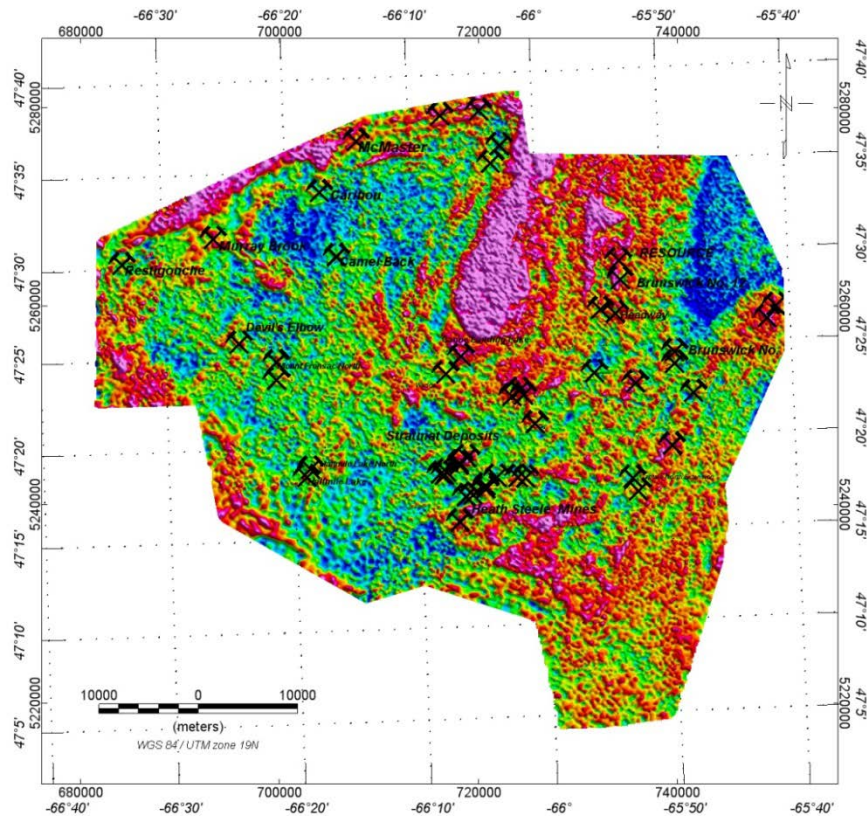
- Alaska: A suite of 3D density models to depths of 50 km, 100 km, and 150 km, discretised to 500 m horizontal resolution, recovered from 3D inversion of 90,000 stations of USGS complete Bouguer gravity data.
- Broken Hill: A 3D density model to depth of 2.4 km, discretised to 50 m cubic cells, recovered from 3D inversion of 5,600 line km of FALCON airborne gravity gradiometry data.



Horizontal cross section at 15 km depth from the 3D density model of Alaska, discretised to 500 m horizontal resolution and depth of 150 km. This model is part of a model suite available for licensing on a non-exclusive basis.

We are now soliciting expressions of interest for the licensing of 3D density models for Australia, Canada and the US.

We are currently inverting all 15,500 line km of the May 2010 re-processed Bell Geospace Air-FTG gravity gradiometry data from the Bathurst Mining Camp in New Brunswick, Canada. The product will be a 3D density model of the entire Bathurst Mining Camp (below). This will be the largest 3D gravity gradiometry inversion ever completed, eclipsing our own 380 million cell inversion of Vredefort FALCON data. This product will be available for licensing from October 2011, and we are now soliciting interest in pre-sales of the product.



Map of 15,500 line km of May 2010 re-processed Air-FTG Gzz data from the Bathurst Mining Camp, New Brunswick, with mine sites superimposed. The entire Air-FTG dataset is currently being inverted to a 3D density model.

AMIRA International project P1058

“One of the major challenges for mining geophysics is the ability to confidently distinguish between economic and uneconomic mineralization.... The goal of this Project is to develop techniques for mineral exploration and mineral discrimination based on spectral induced polarization.”

On July 1, TechnoImaging commenced [AMIRA International Project P1058 Spectral IP for 3D Mineral Discrimination](#).

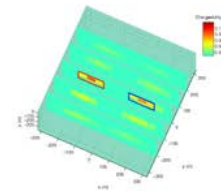
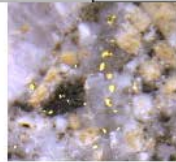
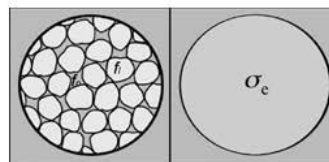
AMIRA P1058 is currently sponsored by Barrick Gold, BHP Billiton, First Quantum Minerals, Geophysical Resources and Services, Khumsup, Teck Resources, Quantec Geoscience, and Zonge International.

Opportunity exists for additional sponsors to join. Please [contact us](#) for further information.



Acquisition

Rock physics



3D inversion

AMIRA P1058 will develop techniques for mineral discrimination based on spectral induced polarization using distributed acquisition systems, laboratory and petrophysical analyses, 3D inversion, and data mining.

Upcoming Events

TechnoImaging will be represented at the following events this year:

- [GeoSynthesis](#), Cape Town, 28 August – 2 September 2011

3D inversion of full tensor magnetic gradiometry data – Michael Zhdanov, Martin Cuma, Glenn Wilson, and Louis Polome (Spectrem Air)

Practical 3D AEM inversion – A case study from Golden Ridge, Tanzania – Glenn Wilson, Leif Cox, Matthew Hope (Barrick), and Michael Zhdanov

Massively parallel 3D gravity gradiometry inversion – A case study from the Vredefort dome – Glenn Wilson, Martin Cuma, and Michael Zhdanov

- [KEGS](#) Toronto September meeting, Toronto, 13 September 2011

Large-scale 3D earth modelling using mega-cell inversions of airborne EM data and giga-cell inversions of potential field data – Glenn Wilson, Michael Zhdanov and TI staff

- [SEG 81st Annual Meeting and Exhibition](#), San Antonio, 18-23 September 2011

Visit TechnoImaging at booth 3236 in the SEG's Exhibition Hall!

TechnoImaging staff co-authored ten presentations at the SEG. Those relevant to mining geophysics will include:

3D inversion of full tensor magnetic gradiometry (FTMG) data – Michael Zhdanov, Hongzhu Cai (U. Utah), and Glenn Wilson

Large-scale 3D inversion of EarthScope MT data from the area surrounding Yellowstone National Park – Michael Zhdanov, Alexander Gribenko, Martin Cuma, Robert Smith (U. Utah), and Marie Green (U. Utah)

3D potential field migration for rapid imaging of gravity gradiometry data – A case study from Broken Hill, Australia, with comparison to 3D regularized inversion – Michael Zhdanov, Martin Cuma, Le Wan, Xiaojun Liu (U. Utah), and Glenn Wilson

Lithological classification of large-scale 3D inversion of airborne electromagnetic, gravity gradiometry, and magnetic data: A case study from Reid-Mahaffy, Ontario – Glenn Wilson, Stephen Fraser (CSIRO), Leif Cox, Martin Cuma, Michael Zhdanov, and Marc Vallee (Fugro Airborne Surveys)

- [KEGS](#) Ottawa September meeting, Ottawa, 14 September 2011

Large-scale 3D earth modelling using mega-cell inversions of airborne EM data and giga-cell inversions of potential field data – Glenn Wilson, Michael Zhdanov and TI staff

Contact

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