MT in Mount Isa – major outcomes and learning
Outline

• Motivation
• Basin study
• Variability study
Motivation

- Along strike continuation of major deposits
- Contains major structural boundary
Motivation

• Mount Isa richly endowed

• But southern area
  – Shallow cover
  – Historically poor exploration success
  – Poor geological understanding
Project dataset

- BBMT data
  - 300 Hz to 1000 s
  - 2 km E-W
  - 5 km N-S
  - 809 sites
  - 16 Hr record
Motivation and background

• AMT data
  – 10,000 Hz to 0.1 Hz
  – 500 m E-W
  – 5 km N-S
  – 849 sites
  – 2 Hr record
Outline

• Motivation and background

• Basin study

• Crustal study
Basin study

- What is the depth to basement?
  - Limited drilling
  - Low resolution gravity
  - MT data unable to be constrained or jointly inverted
Initial inversions

Comparison to drilling
Synthetic modelling

- Shallow low-resistivity layers well resolved
- Basement poorly resolved
Basement sensitivity testing

- Two models based on resistivity structure of project area
- Resistive lower basin unit added
Pre-existing basement interface

• New OzSeeBase interpretation
  – Magnetic depth estimation
• Typically overestimates depth
• Confidence map
Testing pre-existing basement interface

- Synthetic testing using ModEM3D inversion code
- Starting/prior model
- Qualitative determination of basement reliability
Synthetic modelling outcomes

• Eromanga basin sediments reliably delineated
• Basement unable to be reliability determined
• Pre-existing basement surface can be validated qualitatively
Outline

• Motivation and background
• Basin study
• Variability study
Dataset challenges

- Data sensitive to out of array conductors
- Minimal structure indicated
- Very large dataset
Coarse inversion

- Four testing suites
  - Starting model
  - smoothing
  - data component
  - data spacing
- Highly variable inversion results
- Up to 4 low-resistivity features
Variability analysis

- Starting model primary driver of variability
- C2 feature highly variable
- Extent of C3 variable
- C1 low variability
Major outcomes of variability study

• Detailed analysis of variability time consuming but useful

• Subtle data features = high inversion variability?


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Questions?

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