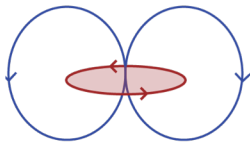# Concluding remarks

EM Induction
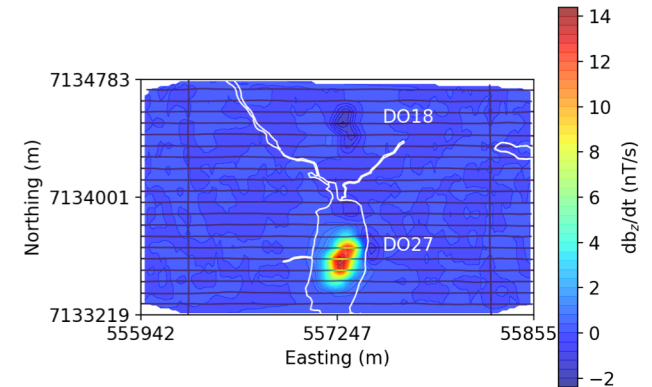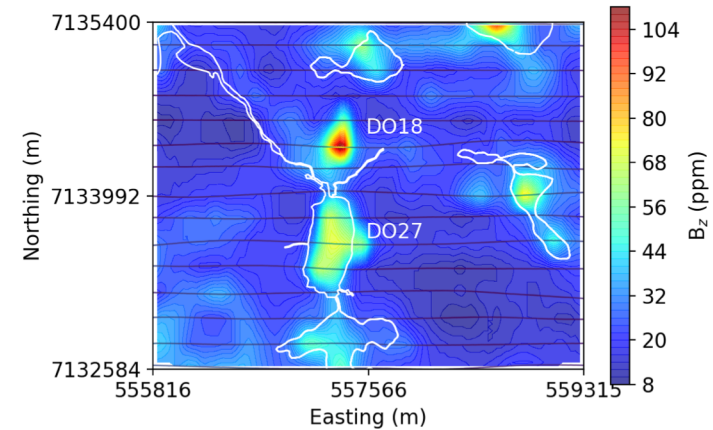

Field Examples

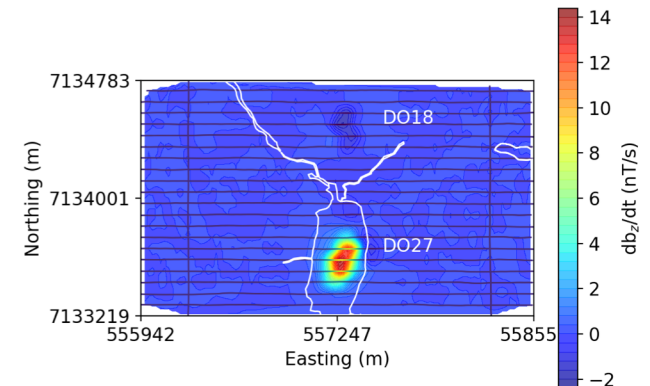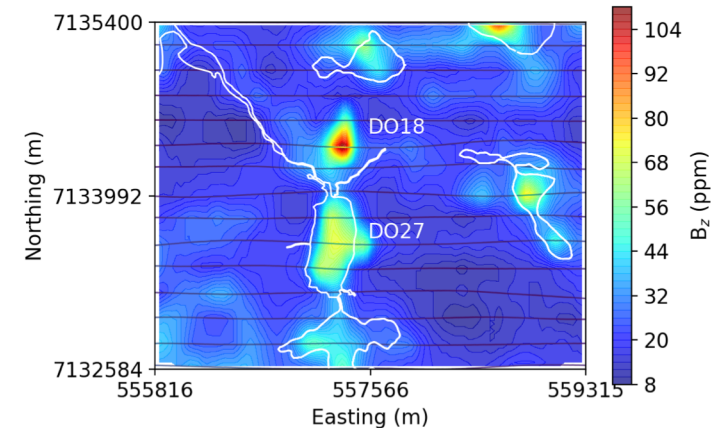Computation

Open Source Software

Questions

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- Find structural details?

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  – Access to software?

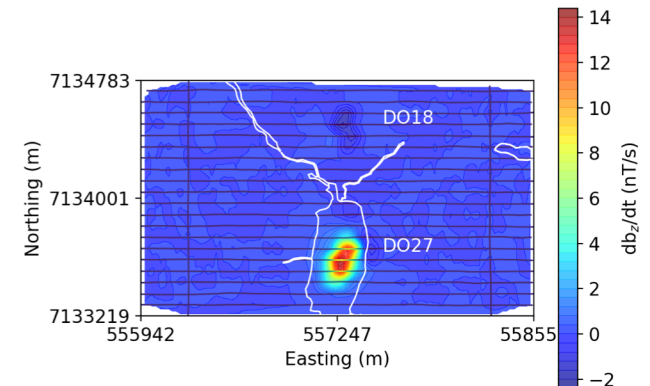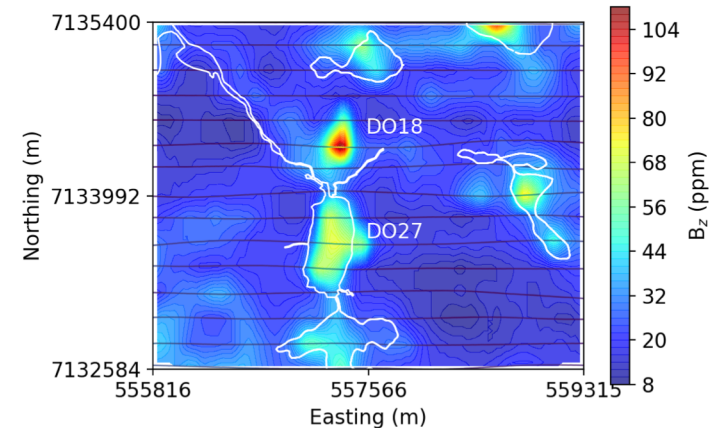 – Need to build something myself?

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  – Access to software?

  – Need to build something myself?

- If I need to build software, what are the challenges?

- Can I collaborate?
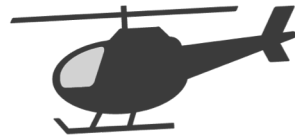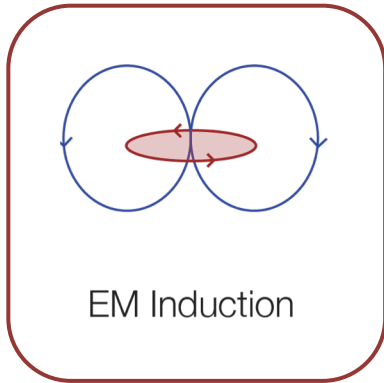
- What is Open Source?

Summary: What was covered?

- Fundamentals of 3D EM

- 3D visualizations of fields and fluxes

- 1D and 3D effects

- Field examples: 1D vs 3D?

- Why is 3D inversion challenging?

- Need for a collaborative community

- Open Source resources

- SimPEG; An example

- Jupyter Notebooks
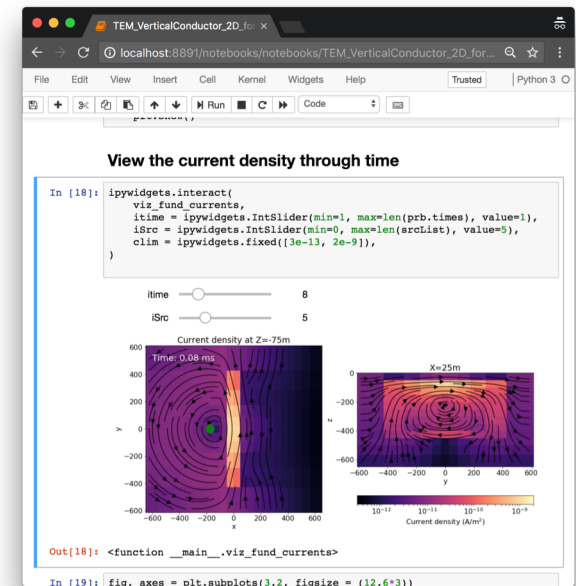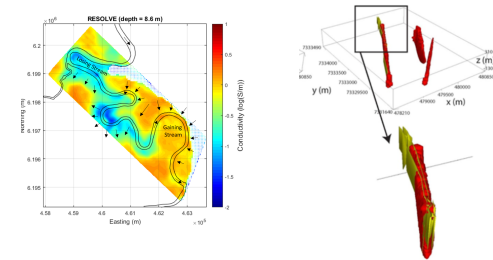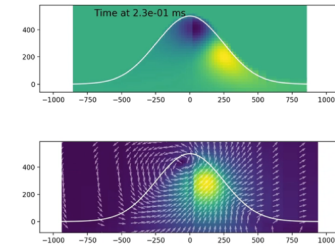
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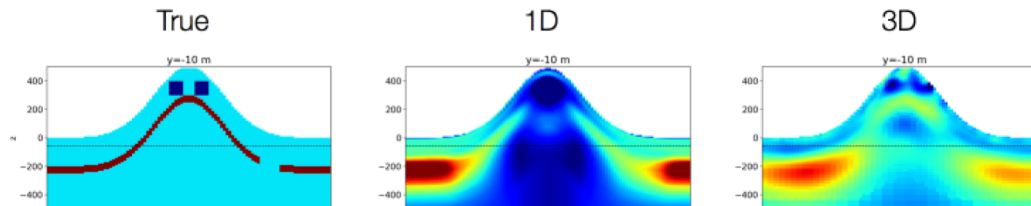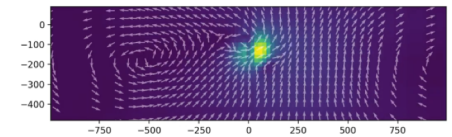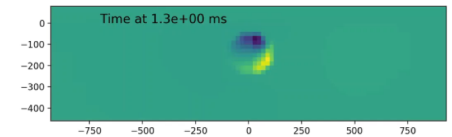

EM Induction

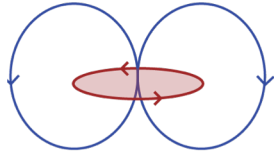Field Examples

Computation

Open Source
Software

- Fundamentals of 3D EM

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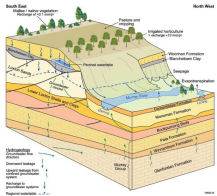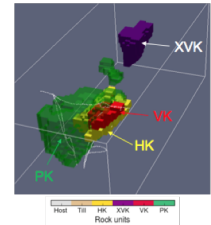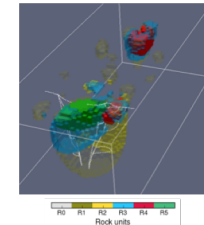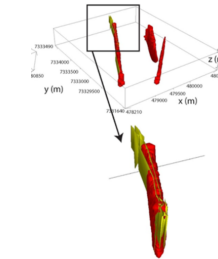

EM Induction

Field Examples

Computation

Open Source Software

- Field examples: 1D vs 3D?
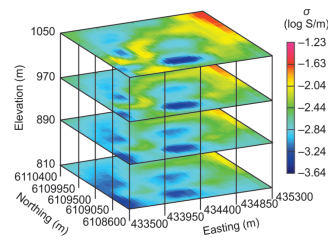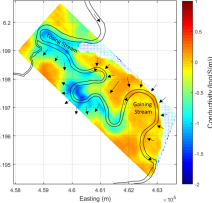
Summary: What was covered?
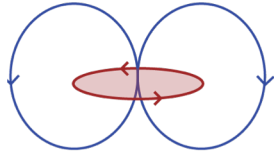
EM Induction

Field Examples

Computation

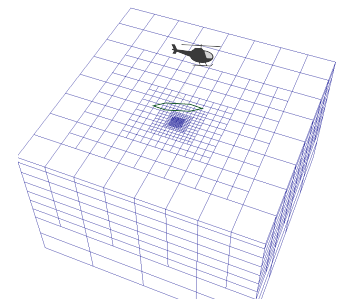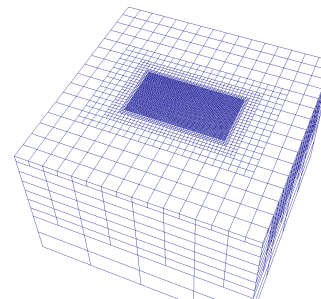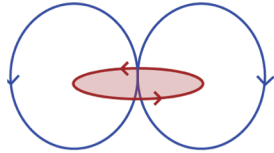Open Source
Software

- Why is 3D inversion challenging?
- Need for a collaborative community

$$\mathbf{A}_{n+1}\mathbf{u}_{n+1} = -\mathbf{B}_n\mathbf{u}_n + \mathbf{q}_{n+1}$$

$$\begin{pmatrix} \mathbf{A}_0 & & & & & \\ \mathbf{B}_1 & \mathbf{A}_1 & & & & \\ & \mathbf{B}_2 & \mathbf{A}_2 & & & \\ & & \ddots & \ddots & & \\ & & & \mathbf{B}_{n-1} & \mathbf{A}_{n-1} & \\ & & & & \mathbf{B}_n & \mathbf{A}_n \end{pmatrix} \begin{pmatrix} \mathbf{u}_0 \\ \mathbf{u}_1 \\ \mathbf{u}_2 \\ \vdots \\ \mathbf{u}_{n-1} \\ \mathbf{u}_n \end{pmatrix} = \begin{pmatrix} \mathbf{q}_0 \\ \mathbf{q}_1 \\ \mathbf{q}_2 \\ \vdots \\ \mathbf{q}_{n-1} \\ \mathbf{q}_n \end{pmatrix}$$

Summary: What was covered?

EM Induction

Field Examples

Computation

Open Source Software

- Open Source resources
- SimPEG
- Jupyter Notebooks

simpeg

Github
versioning, collaborating
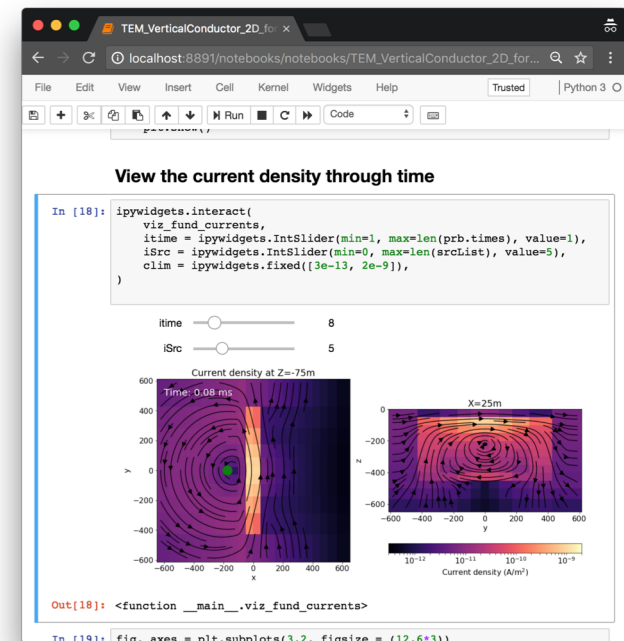
Travis CI
testing, deploy

Jupyter
interactive computing

Creative Commons
licensing, reuse

Python
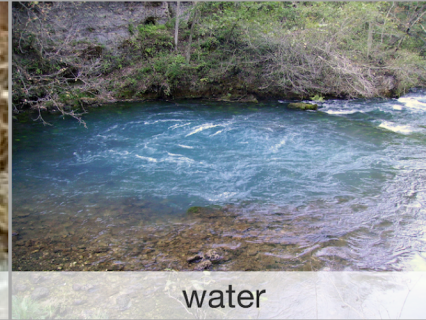computation

Where are we?

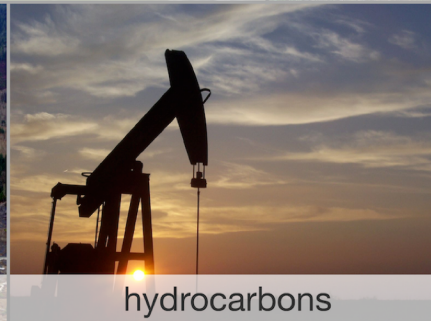## EM geophysics can play a role in …

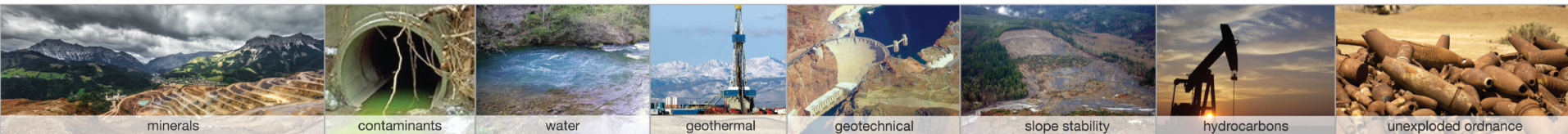minerals · contaminants · water · geothermal · geotechnical · slope stability · hydrocarbons · unexploded ordnance
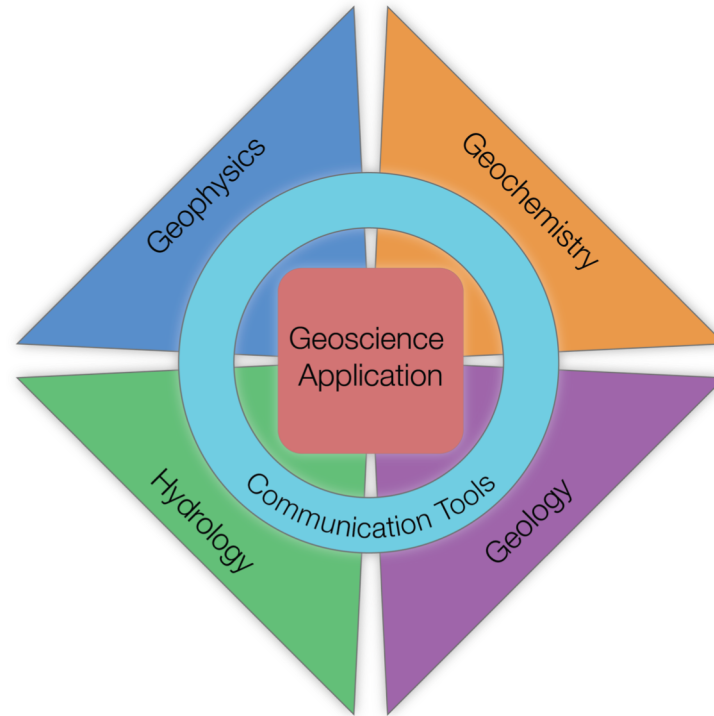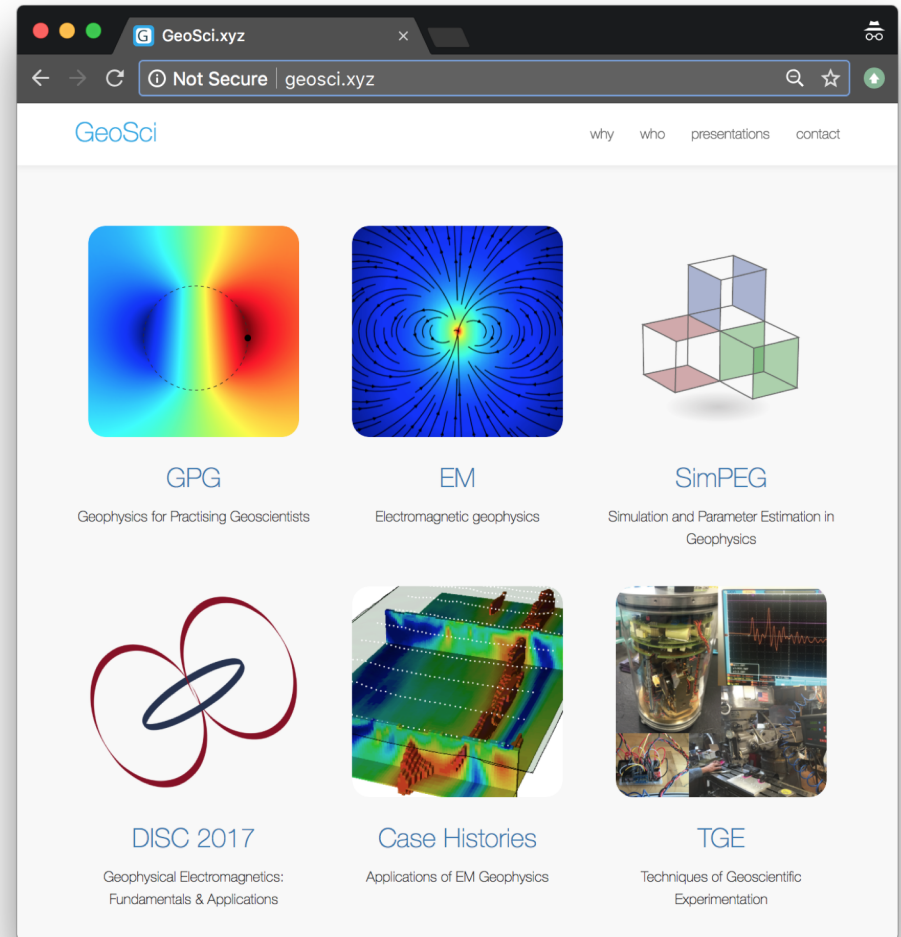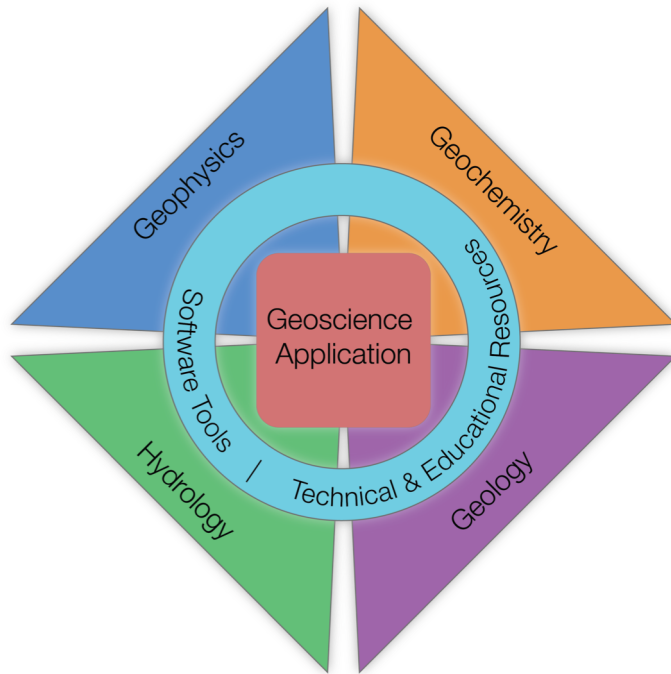
Next Generation of Geoscience Problems

Open Source Resources

Thank You

Resources

geosci.xyz

simpeg.xyz

slack.simpeg.xyz

courses.geosci.xyz/aem2018

SimPEG Team
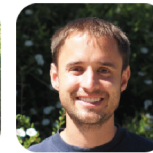

Rowan Seogi Lindsey Gudni Brendan

Dom Thibaut Mike Craig Joe

Devin Franklin Dieter Adam Doug