Real simulation tools in introductory courses: packaging and repurposing our research code.

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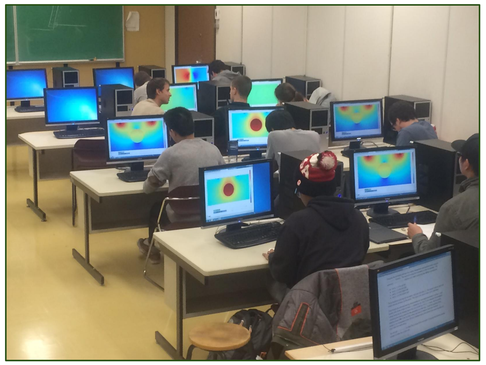
Why?

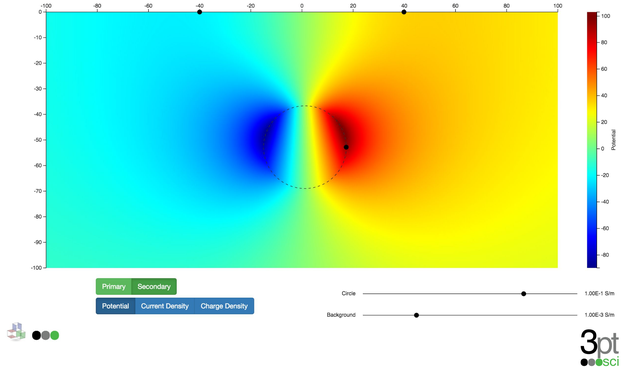
Simulations: Tools for Exploration



Problem: DC Resistivity??

$$\nabla \cdot \sigma \nabla \phi = -q$$

IMAGE NOT AVAILABLE



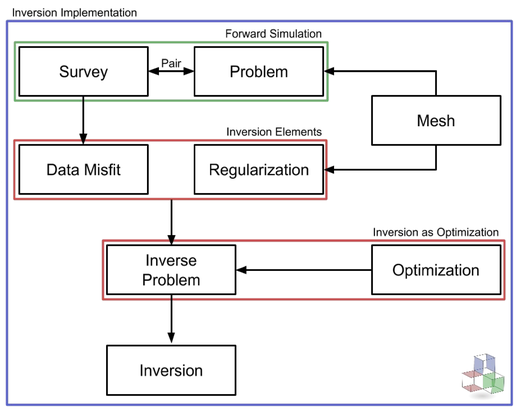
What if ... ?

- what if the sphere is resistive?
  - conductive?
- where do charges build up?
  - positive?
  - negative?
- what happens to the currents?
- what does the electric field look like?
- how do the potentials behave?
- how does this impact the data we measure?

We have the tools to explore.

```
In [1]: import SimPEG

In [ ]: SimPEG.
        SimPEG.DataMisfit
        SimPEG.Directives
        SimPEG.Fields
        SimPEG.InvProblem
        SimPEG.Inversion
        SimPEG.Maps
        SimPEG.Mesh
        SimPEG.Models
        SimPEG.Optimization
        SimPEG.Problem
```

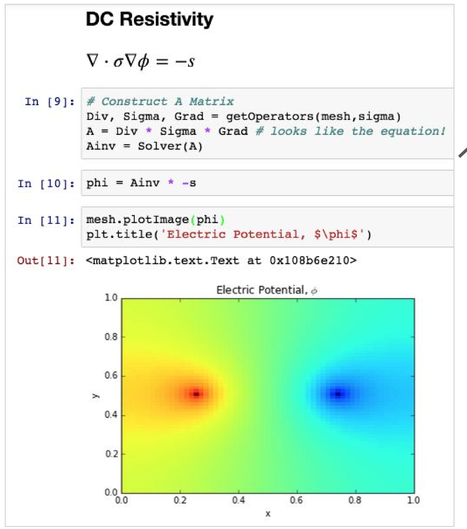


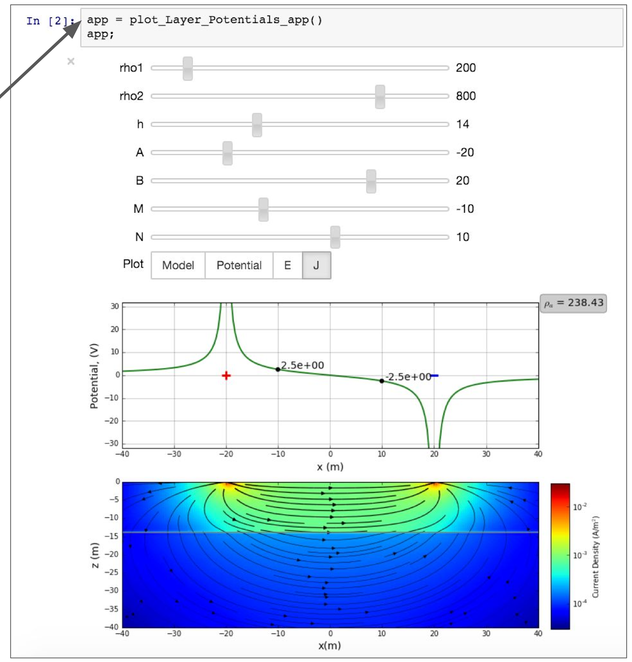
pypi v0.1.3 | downloads 3k/month | license MIT | build passing | coverage 83%

How?

Open Source!

Approach: Lower barriers to entry by exposing an appropriate level of detail and making it interactive!





Don't take our word for it

> "IPython apps were excellent visual learning tools, really gave a good practical emphasis on theoretical concepts
>
> "python notebooks were very helpful visual aids
>
> "I like the python interactiveness
>
> "The notebooks were great!
>
> - 2015 EOSC 350 Students

Want more?

- gpg.geosci.xyz
- simpeg.xyz
- github.com/ubcgif
- lheagy@eos.ubc.ca