ImpDAR Tutorial

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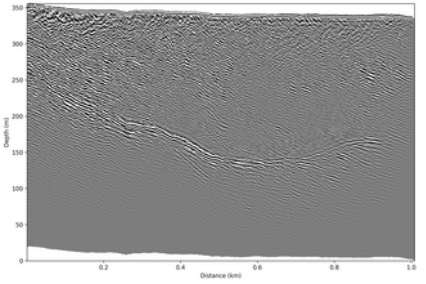
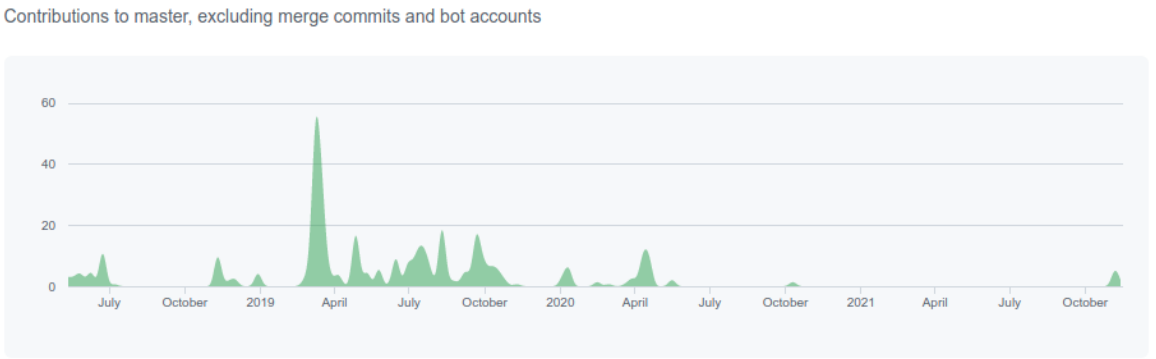
Radar Processing

- Converting raw, binary radar output to a usable (and useful) form:
  1) Load data into usable array
  2) Process to reduce noise, convert to useful coordinates, etc.
  3) Interpret (pick layers/features)
  4) Plot (echograms, geographically, etc.)



ImpDAR

- Fully open source **imp**ulse ra**dar** processor
  - Unites processing chain for different systems
  - Can be used for loading, processing, interpreting, and plotting
  - Developed at U. Washington, based on (standard) codes from St. Olaf

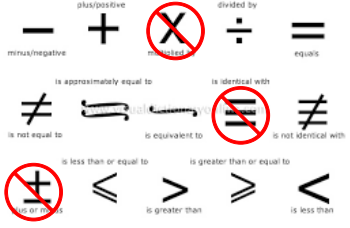


Problems ImpDAR solves

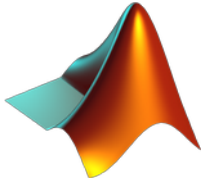
- Proprietary (expensive) radar software

- Lack of transparency in operations

- Lack of reproducibility



- Missing operations in alternatives



- Matlab alternatives require updates/relicensing

Installing ImpDAR

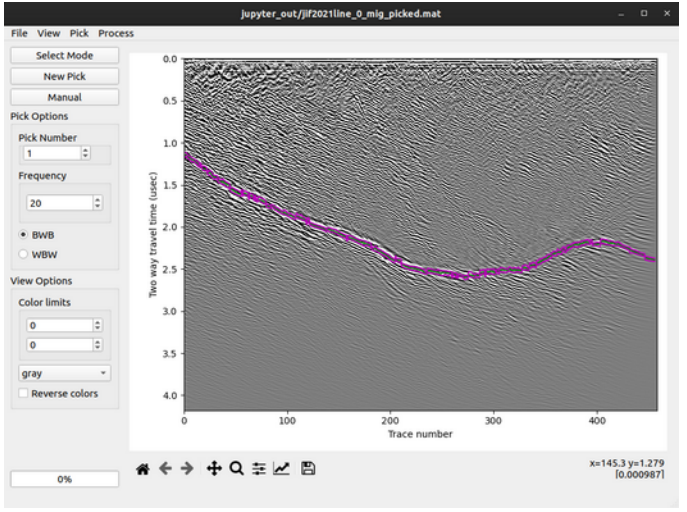
- Requirements are mostly conda/pip installable
- SeisUnix is very useful, we can talk about installation later if there is interest
- ImpDAR itself installable with pip (including some accelerated migration routines) or directly from Github (for bleeding edge)

Interacting with ImpDAR: Load+process

- Command Line
  - Very quick for batches
  - Intermediate output saved to look at
  - Cannot access every single option
  - Can fail for complex use cases
- API (programmatic)
  - More control over steps
  - Less need to save intermediate output
  - Less quick for one-offs

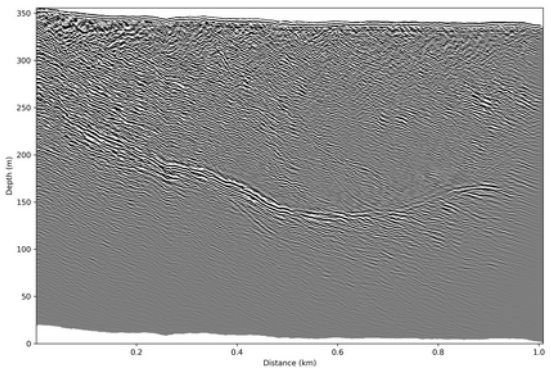
Interacting with ImpDAR: Interpretation

- Requires PyQt5 (and thus Qt5)
- Always called from the command line, handled in GUI
- I am not an expert in making GUIs—you may find bugs!

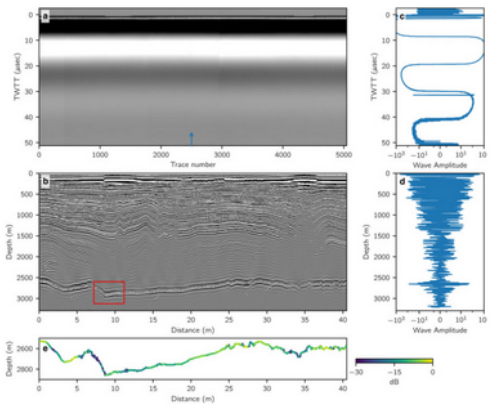


Interacting with ImpDAR: Plotting

- Command Line
  - Very quick for batches
  - Only very basic customization



- API (programmatic)
  - Can mix ImpDAR plots with anything else from matplotlib
  - Can create publication-quality figures (have been included in at least 3 papers so far)
  - May be unnecessarily complex for other uses



Getting help

1) impdar.readthedocs.io
   - Check the documentation yourself first, then either
2) github.com/dlilien/impdar/issues
   - Raise an issue via github or
3) david.lilien@umanitoba.ca
   - Email me for help