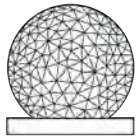
Radio Science Education at Haystack

John Swoboda



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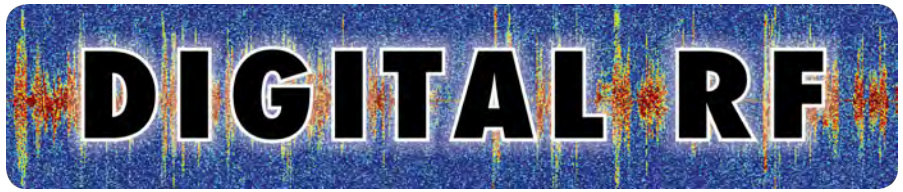
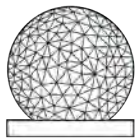
Software





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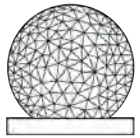
Python and Anaconda

- Programing language
- Open-source
- Free!
- Many scientific libraries
- One of the most used programing languages

- Package manager
- Free!
- Compatible with Windows Mac and Linux
- Avoids having to build from source
- Can create environments



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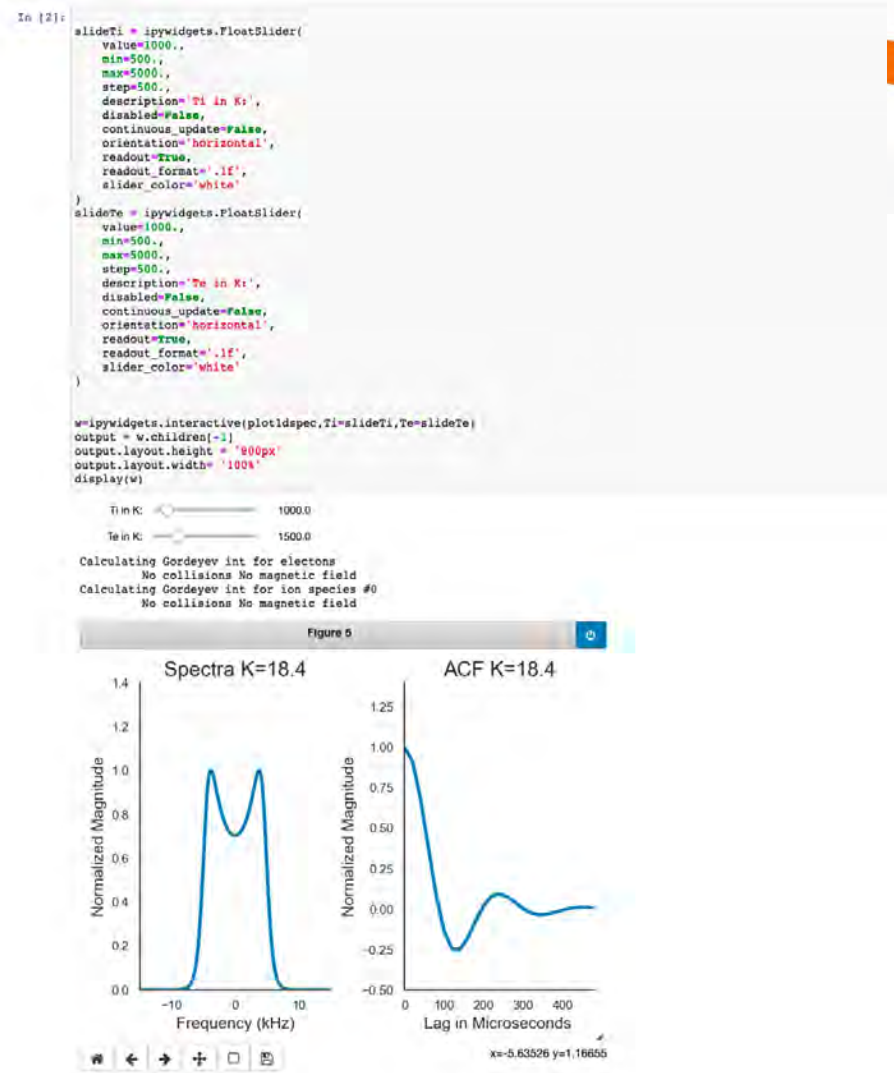
Jupyter Notebooks

- Documents “containing code, visualizations and narrative text”
- Allow for easy sharing in education environment
- Used in the remote ISR Summer School



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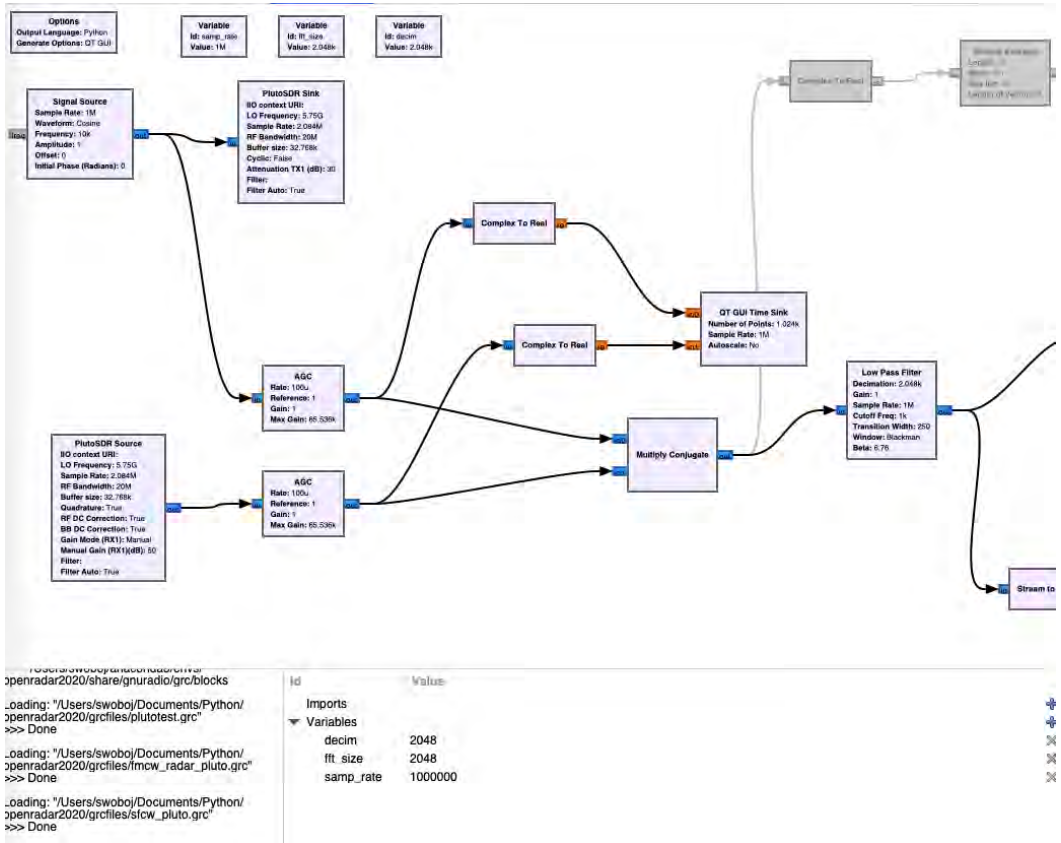
GNURadio

- Tool kit to implement software radios
- Includes signal processing tools
- Contains a GUI interface for making flow graphs to implement radio processes



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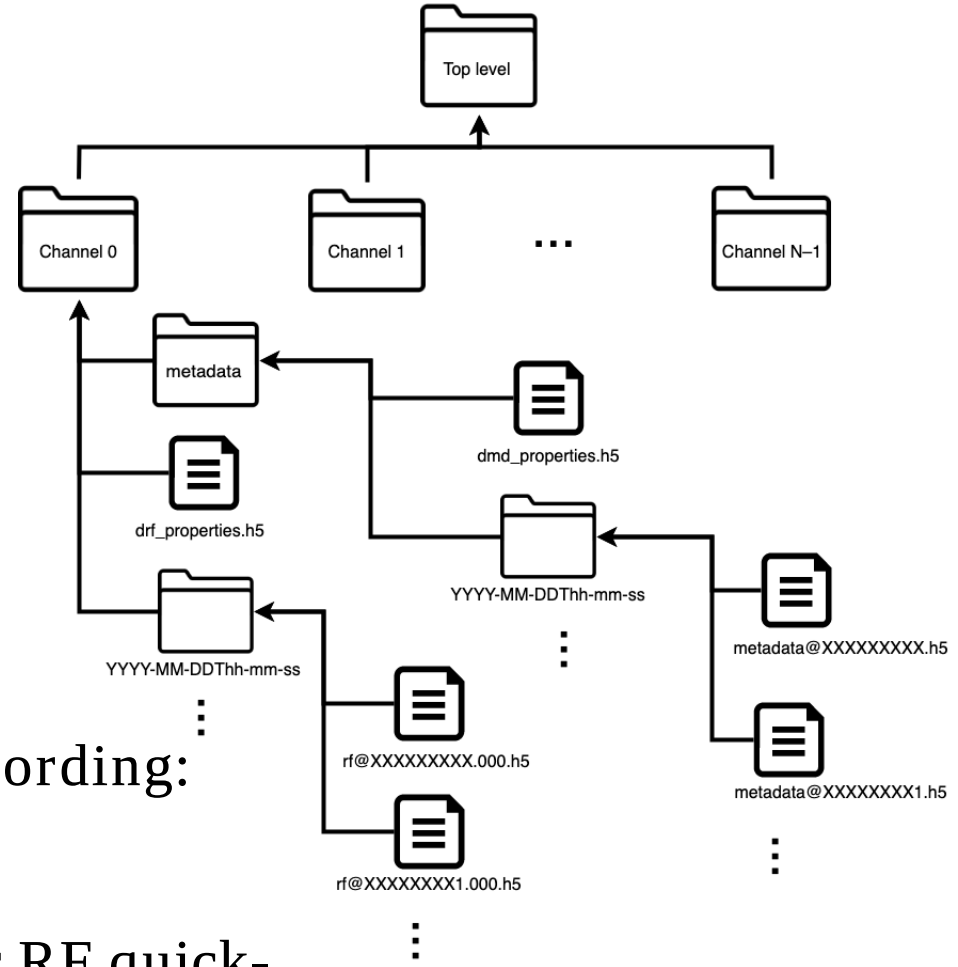
Digital RF and Digital Metadata

- Self-documenting for data archival
- O(1) sample lookup for quickly reading any segment of data
- Included with package:
  - Easy-to-use command-line program for data recording: the Haystack Observatory Recorder (thor)
  - Snapshot and ring buffer tools
  - Plotting tools built in for easy debugging and for RF quick-look spectrograms
  - Geophysical measurement examples
    - Satellite beacon receiver
    - Ionospheric sounder



Digital RF/Metadata file structure

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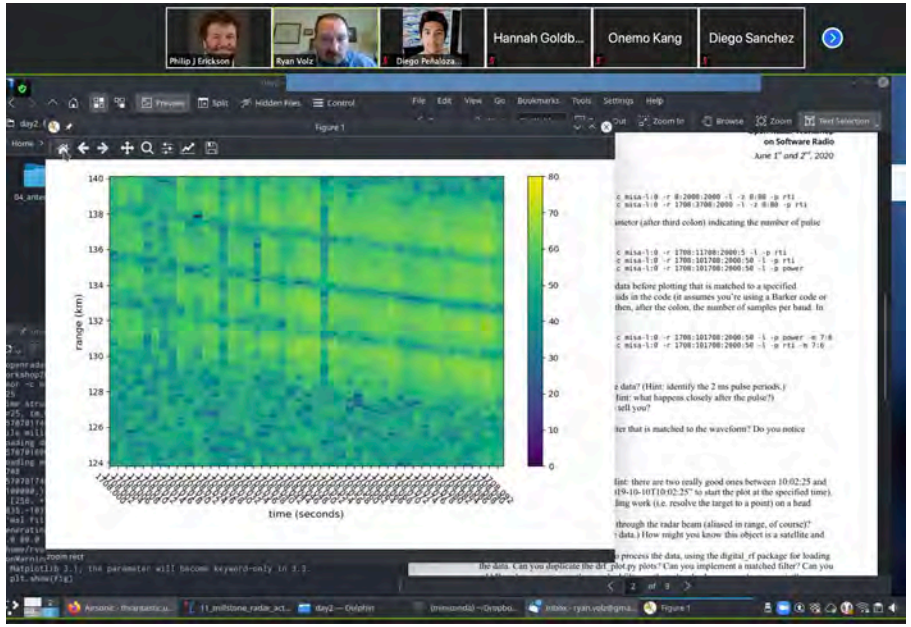
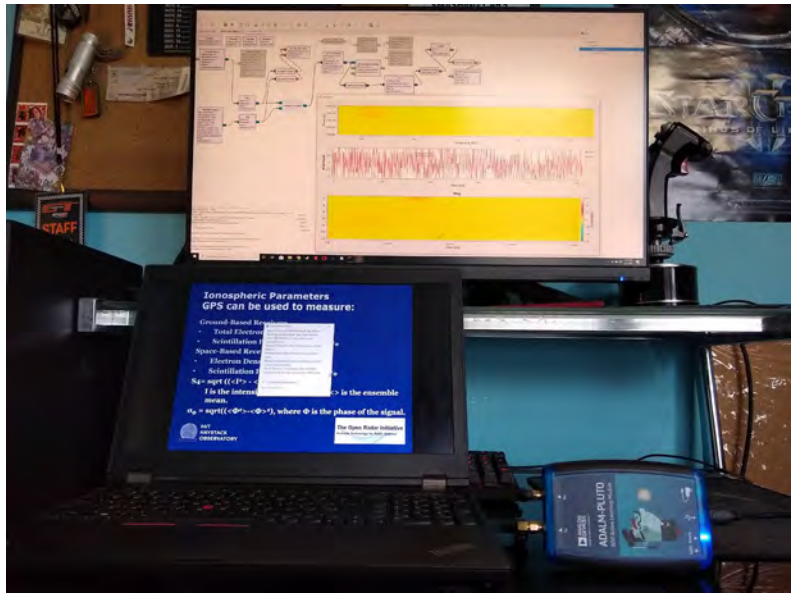
Open Radar Workshop





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