Radio Science Education at Haystack

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Software











MIT HAYSTACK OBSERVATORY



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



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







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 quicklook spectrograms
 - Geophysical measurement examples
 - Satellite beacon receiver
 - Ionospheric sounder





Digital RF/Metadata file structure



Open Radar Workshop



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