

Opening ARM: A pivot to community software to meet the needs of users and stakeholders of the planet's largest cloud observatory

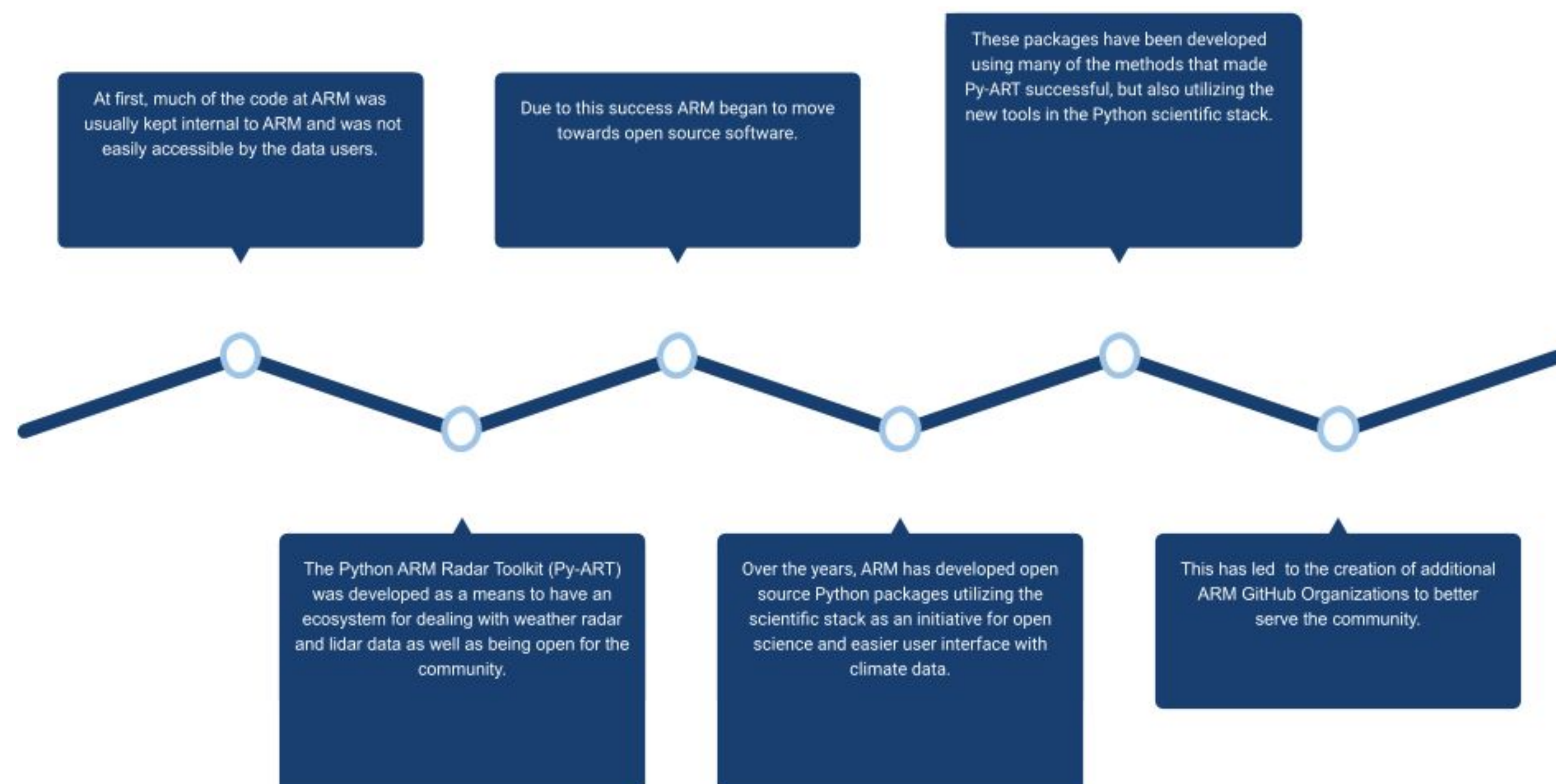
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ARM and Open Source

The Atmospheric Radiation Measurement (ARM) program is a multi-laboratory, U.S. Department of Energy (DOE) scientific user facility that collects atmospheric data all over the world, making it freely available with the goal of improving climate models. This presentation will discuss the evolution (and hurdles that came with) of ARM's open source endeavors, starting with the Python ARM Radar Toolkit to the Atmospheric data Community Toolkit in 2018, the expansion of our open-source presence on Github in 2019 and what is planned for the future.

ARM Moving Towards Open Source



Py-ART

Py-ART is an open-source Python package focused on reading, correcting, and plotting weather radar data, funded by the Atmosphere Radiation Measurement (ARM) User Facility

- Developed using NumPy distutils, nosetests, appveyor, PIL and more.
- Original setup was time consuming with many setbacks along the way (dependency support ending, conflicts and more)
- Currently updating the data model to be compatible with the pangeo ecosystem

ACT

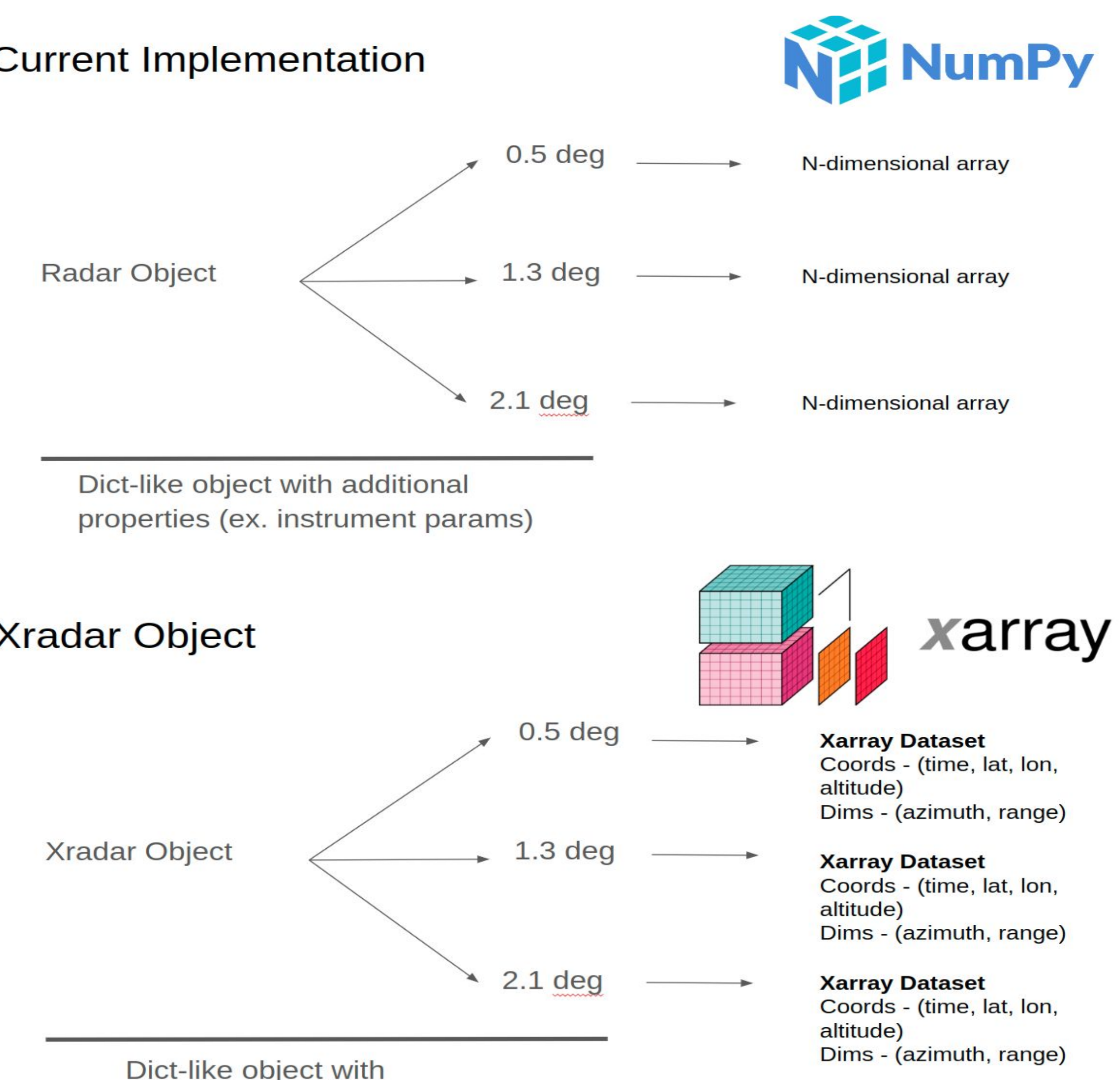
The Atmospheric data Community Toolkit (ACT) is an open source Python toolkit for working with atmospheric time-series datasets of varying dimensions.

- Developed using setuptools, pytest and Xarray.
- Setup was easier with current tools.
- More flexibility with core data model due to utilizing Xarray.
- Through significant outreach, education, and review ARM has been supporting ACT since 2019.

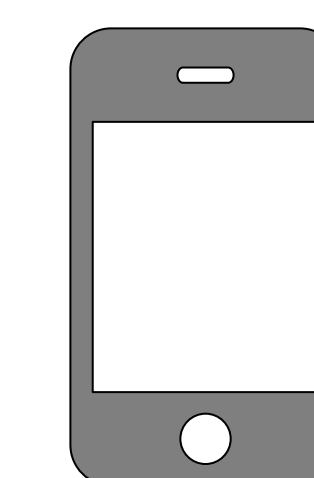
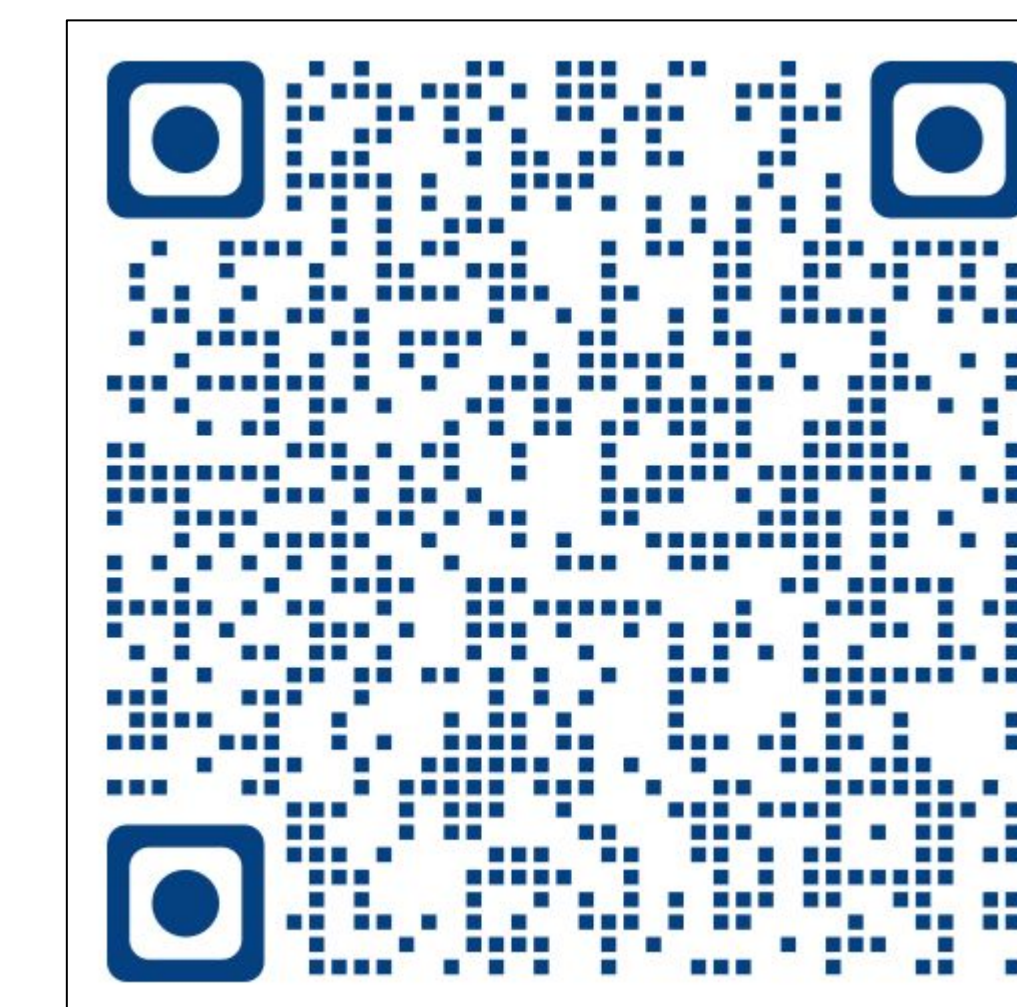
Learning and Evolving

- At the time, tools were limited, so Py-ART was developed using the tools available at the time, many that no longer are supported (Basemap, PIL, Nose).
- Utilized coding practices that made Py-ART successful and then applied them to ACT.
- Tools that make ACT powerful are now being integrated into Py-ART and other ARM packages.
- Newer packages are utilizing code practices learned from both Py-ART and ACT.

Current Implementation



Utilizing the Python Scientific Stack and Open Source Tools



Take a picture to checkout the cookbook

Summary

- Py-ART and ACT have new roadmaps over next 5 years
- Updating PyART to use tools such as Xarray.
- These tools have made Py-ART and ACT successful, both used around the globe.
- ARM is fully embracing the benefits of open source code, beginning with PyART and ACT, but now many open source activities in ARM:
 - ARM-supported (PySP2)
 - grassroots efforts (RadTraQ).

Future Work

- Finish integrating Xarray into Py-ART.
- Produce more cookbooks utilizing Project Pythia format.
- Continue engaging with the open source community..
- Utilize new tools from the Python scientific stack in ARM open source packages, while continuing to push ARM to open source.
- Utilize feedback from the community to enhance ARM packages.