Facilitating Remote Realtime Research through Enhancements to Python Monitoring Software for the NCAR Microwave Temperature Profiler

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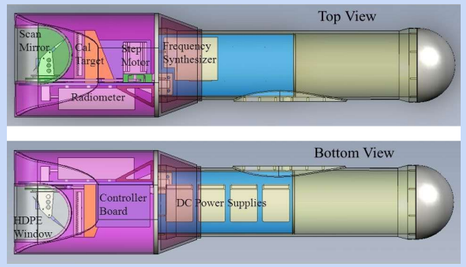
Background

- **The Microwave Temperature Profiler** (MTP) measures the temperature of the atmosphere.
- It is attached to an airplane where the device measures *emitted radiance*, or the energy given off by oxygen molecules at specific frequencies.



- By taking several scans, one can calculate the ambient temperature at the airplane's altitude.
- The MTP is particularly useful for finding the altitude of the **tropopause**, or the boundary between the troposphere and the stratosphere.

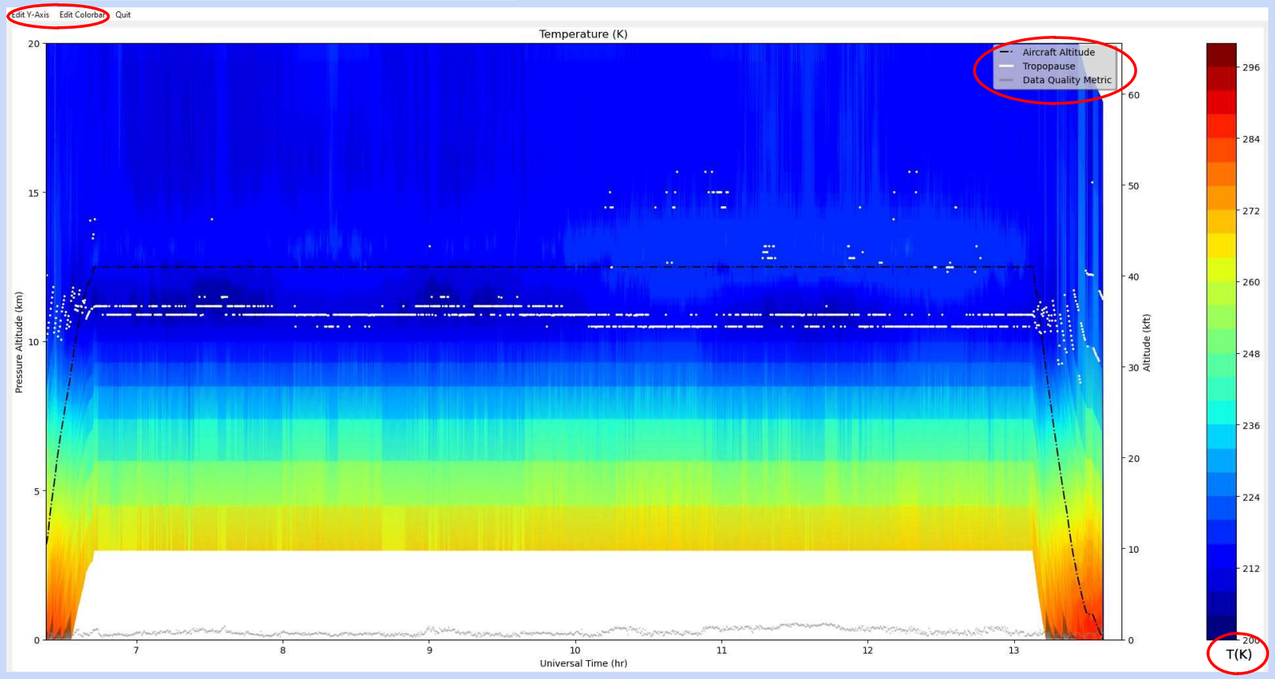
Objectives

- Update workflow to better incorporate Git/GitHub
- Add enhanced usability features
- Allow for multiple tropopauses to be detected and plotted
- Add plot adjustment features without having to regenerate the entire plot

Tools

Jira Software, python, GitHub, Visual Studio Code

Example Curtain Plot



This plot is an example of what the data collected by the MTP looks like once all the scans from a specific flight have been collected.

This project was specifically related to adding features to make interpreting this plot easier and editing it more user-friendly. The features with a red circle around them were added in order to achieve those goals.

Future Work

- Remove faulty scans from the dataset
- Add tooltips so that when users hover over certain aspects of the tool, a box describing its purpose and usage pops up
- Remove visual artifacts (the vertical lines which reveal individual scans)

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