AuroraX and aurorax-asilib: a user-friendly auroral all-sky imager analysis framework

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Key Points:

- AuroraX is an online interface to visualize the aurora and calculate conjunctions
- aurorax-asilib is a companion Python package for detailed analysis of auroral all-sky imager data
- Together, these tools enable the end-to-end analysis of the aurora

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Abstract

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Plain Language Summary

1 Introduction

OUTLINE

- Brief history of ASIs and ASI arrays. Talk about why THEMIS ASI exists. Discuss CANOPUS?
- With these ASI arrays, the volume of data is immense.
- Why this software? Aurora ASI data formats very greatly, each with their own caveats. Our goal is to remove the need for scientists needing to write duplicate code to use these popular missions. AS a result, this will enable scientists to dive right into the science and not need to know the details of data management (downloading and loading data, as well as applying routine data processing steps)

2 Design Philosophy

OUTLINE

- The primary design philosophy is to offer a relatively small set of functionality that is useful for most researchers studying the aurora. We strived to strike a balance between a complex and a user-friendly tool.
- Online keogram and conjunction interface accessible anywhere with internet connection.
- Comprehensive ASI data analysis functionality on a PC.

3 AuroraX

OUTLINE

- What is it?
- A highly optimized conjunction search
- On-demand keograms
- Virtual Observatory

4 aurorax-asilib

OUTLINE

- What is it?
- Plug-in based architecture
- Handles the downloading and loading of ASI images. Ultimately, ASI image files consists of time stamps and images, so the load data is equally as simple.
- Similarly with skymap calibration files.
- If a file is already downloaded, you do not need an internet connection to work with the data.
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OUTLINE

- asilib on GitHub. unit and integration tests run automatically before every release.
- THEMIS and REGO data formats are set and won't change.

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