**NASA DEVELOP National Program**

****NASA Langley Research Center

**Summer 2015**

**Short Title: CALIPSO Cross-Cutting II**

**Subtitle:** Interfacing CALISPO Data through a Graphical User Interface

**VPS Title:** Catching the Black Smoke: Developing a Visualization Tool to Measure Aerosols with CALIPSO

**Project Team & Partners**

**Project Team:**

Grant Mercer (Project Lead), grant.a.mercer@nasa.gov

Nathan Qian

**Advisors & Mentors:**

Jeffry Ely (NASA DEVELOP National Program)

Dr. Kenton Ross (NASA DEVELOP National Program)

**Past or Other Contributors:**

Jordan Vaa

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**Partner Organizations**

CALIPSO Science Team, End-User, POC: Dr. Charles Trepte and Dr. Amber Soja

**Project Details**

**Applied Sciences National Applications Addressed:**

Cross-Cutting

**Study Area:** Global

**Study Period:** May 2006 - Current

**Earth Observations & Parameters**

CALIPSO, CALIOP – Vertical Profile of Aerosols

**Ancillary Datasets Utilized**

None

**Models Utilized**

None

**Software Utilized**

Python 2.7, sqlite3

**Project Overview**

**80-100 Word Objectives Overview**

The CALIPSO satellite provides a wealth of information on the Earth’s atmosphere that allows researchers to examine aerosols, such as dust, smoke, or pollution, in the sky from all over the world. However, the current program used to read CALIPSO data is written in a proprietary language that is not easily adaptable and lacks database sharing. This project intends to address these issues by developing a new tool that is open source and allows researchers to save and share their CALIPSO findings.

**Abstract**

The CALIPSO satellite (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation) is a NASA Earth observation that analyzes aerosol particles suspended in the Earth’s atmosphere. Researchers use CALIPSO data to track the global distribution, dispersion and source of aerosols. However, researchers have a hard time tracking specific airborne objects as the current visualization tool that reads CALIPSO data lacks the feature to highlight unique aerosols and has no method of sharing aerosol data. The original CALIPSO visualization program was written in a propriety language, which prevents users from making the necessary adjustments. To rectify these issues, a NASA DEVELOP team created a new visualization tool written in Python that is open source and displays CALIPSO data. For this summer term, our team implemented new features that will help scientists track aerosols and share this data with each other. These additional features will allow scientists to more easily identify the sources of aerosols and their impact on the Earth.

**Community Concerns**

* The current CALIPSO visualization tool is not easily configurable or adaptable
* The CALIPSO science team lacks a method for storing and sharing specific features of CALIPSO imagery

**Current Management Practices & Policies**

The tool currently used to visualize CALIPSO data is written in IDL, a proprietary language which lacks many features and hinders open source updates.

**Decision Support Tools & Benefits**

|  |  |  |
| --- | --- | --- |
| **End-Product** | **Earth Observations Used** | **Benefit & Impact** |
| New CALIPSO Data Visualization Tool | CALIPSO | Our end users will have an open source, low maintenance program that can intuitively display and manipulate CALIPSO data. |

**Project Imagery**

**[Insert image here]**

**Caption:** [Insert Caption Here. Max of 25 words.] Image Credit: [Insert project short title] Team.

**Image:** File Name (Please submit your image as a separate .jpeg as well as inserting it in this document)