

CUBESAT DATA ANALYSIS SOFTWARE

UNDERSTANDING CUBESAT DATA

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Kumu A'o CubeSat Project

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Concept

- ***Temperature Data***

- ***Solar Cell Data***

Space Weather

- *Solar Activity Cycle*
- *Seasonal Observations*

NSF - Data Analysis

- ***CubeSat-based Science Missions***
- ***Data Analysis of Key Measurements***

Instruments

Instruments Table

Satellite	Instrument	Accuracy
SORCE	Total Irradiance Monitor (TIM)	Measures TSI to an estimated absolute accuracy of 350 ppm (0.035%)
Kumu A'o	Thin Film Platinum Resistance Detector (Pt-RTD)	Accuracy: Not Available Yet
Kumu A'o	Solar Cells	Accuracy: approximately 26.5%

Note: The accuracy of the Pt-RTD is not know at this time due to factors not experienced yet, i.e. spin of cube in orbit effecting the alignment of the sensors, other heat source onboard that may effect the temperature readings.

Kumu A'o CubeSat Sensor

- **Resistance Temperature Detectors (Pt-RTD)**

- **Our Wish List:**

 - High Precision Sensors**

 - Bolometer

 - Pyranometer

 - Thermopile

 - Photodiode

 - Phototransister

 - Radiometer

Kumu A'o CubeSat Solar Cells

Solar Cell Production

Quantity	Size cm ²	Total cm ²	Solar Constant w/cm ²	Estimated total production per side	Efficiency	Total estimated production
2	28	54	.1366	7.37 w/cm ²	26.5%	Approx. 2 watts/cm ²

SORCE/LASP Data Products

SOLar Radiation & Climate Experiment (SORCE)

Total Irradiance Monitor (TIM)

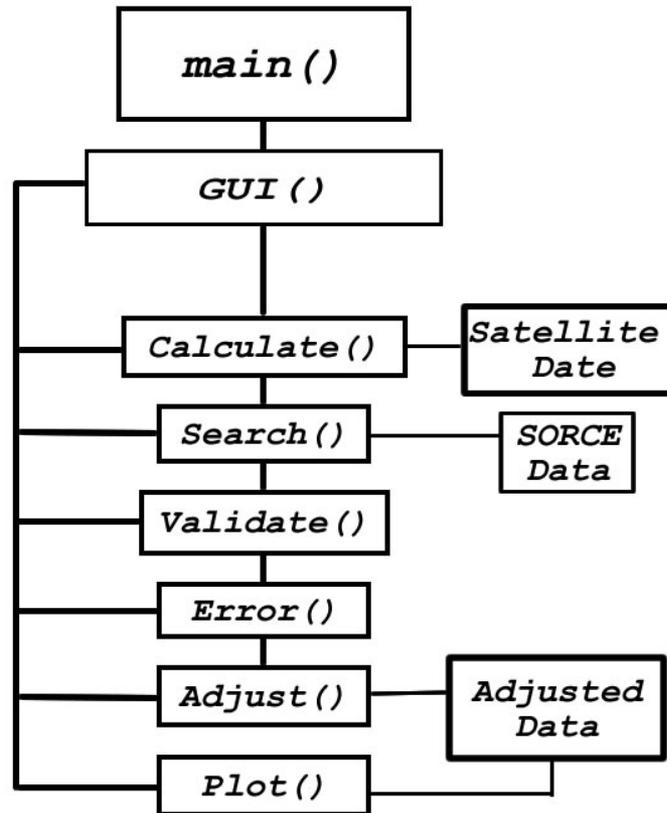
Satellite	Data Product
SORCE	Total Solar Irradiance (TSI)

Program Requirements

- ***Calculate***
- ***Search***
- ***Validate***
- ***Error***
- ***Adjust***
- ***Plot***

Program Diagram

□ Diagram



MIN / MAX

□ *Minimizing Need for Attitude Controls*

By finding the maximum value amongst the sensors installed on all sides of the Cube there would be no need to point the Cube in the Sun's direction.

□ *Maximizing Data Validity*

Increasing the population of record sets being matched to SORCE data due to inaccuracies.

CubeSat Components

□ Components of a CubeSat Project

Structural	
Telecommunications	TELCOM
Electrical Power System	EPS
Command and Data Handling	C&DH
Mechanical	MECH
Ground Station	GS
Data Analysis Software	DAS

Quote

□ **Thomas Edison:**

I have not failed. I've just found 10,000 ways that won't work.

The End



*Mohalo to
Cal-Poly,
University of Hawaii
and to the entire
CubeSat Community.*