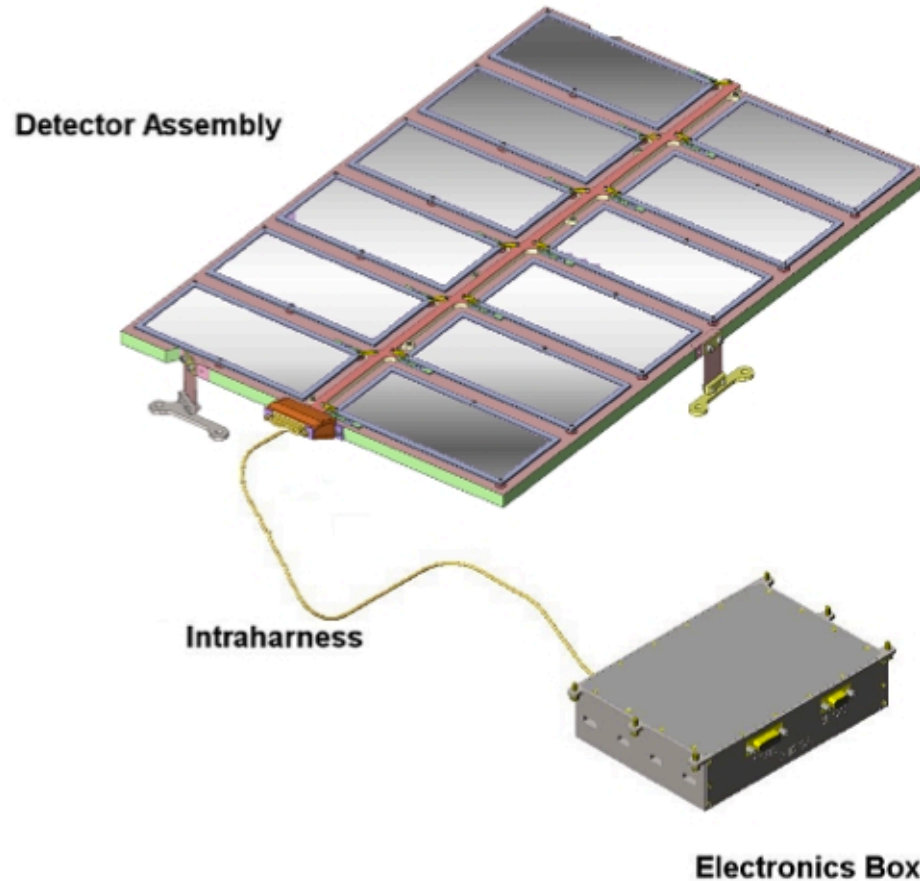# SDC PDS Review

KEM Encounter Data: 2018-08-14 to 2019-01-20
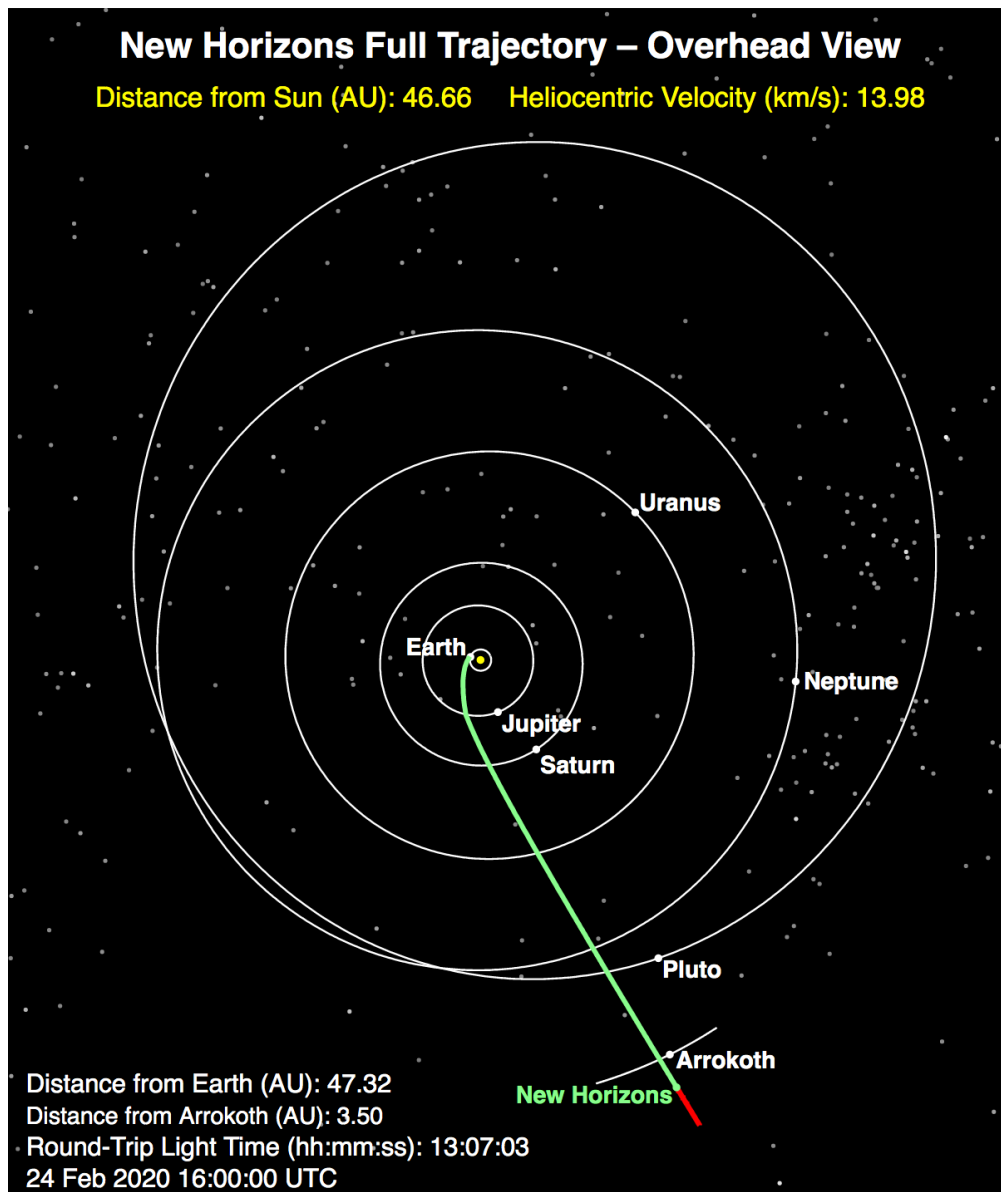
A.R. Poppe

U.C. Berkeley

February 26, 2020

SDC Instrument

SDC instrument:
- 14 detectors: 12 science (with 1 defunct), 2 reference
- electronics box for signal processing, telemetry/commands

Current Release

New Horizons Full Trajectory – Overhead View
Distance from Sun (AU): 46.66   Heliocentric Velocity (km/s): 13.98

Uranus
Neptune
Earth
Jupiter
Saturn
Pluto
Arrokoth
New Horizons

Distance from Earth (AU): 47.32
Distance from Arrokoth (AU): 3.50
Round-Trip Light Time (hh:mm:ss): 13:07:03
24 Feb 2020 16:00:00 UTC

Current dataset:

- KEM Encounter
- Aug 2018 to Jan 2019

KEM Encounter

KEM Encounter: SDC Raw Data

Index	Extension	Type	Dimension	View				
☐ 0	Primary	Image	0	Header	Image		Table	
☐ 1	DATA	Binary	6 cols X 32 rows	Header	Hist	Plot	All	Select
☐ 2	HOUSEKEEPING_SDC	Binary	9 cols X 0 rows	Header	Hist	Plot	All	Select
☐ 3	HOUSEKEEPING_0X004	Binary	37 cols X 1 rows	Header	Hist	Plot	All	Select
☐ 4	HOUSEKEEPING_0X00D	Binary	8 cols X 1 rows	Header	Hist	Plot	All	Select
☐ 5	HOUSEKEEPING_0X00A	Binary	5 cols X 1 rows	Header	Hist	Plot	All	Select
☐ 6	THRUSTERS	Binary	28 cols X 0 rows	Header	Hist	Plot	All	Select

Total Columns: 6
Total Rows : 32

Selected columns for display

■ Copy Number
■ Channel ID
■ Zero Fill
■ Threshold
■ Magnitude
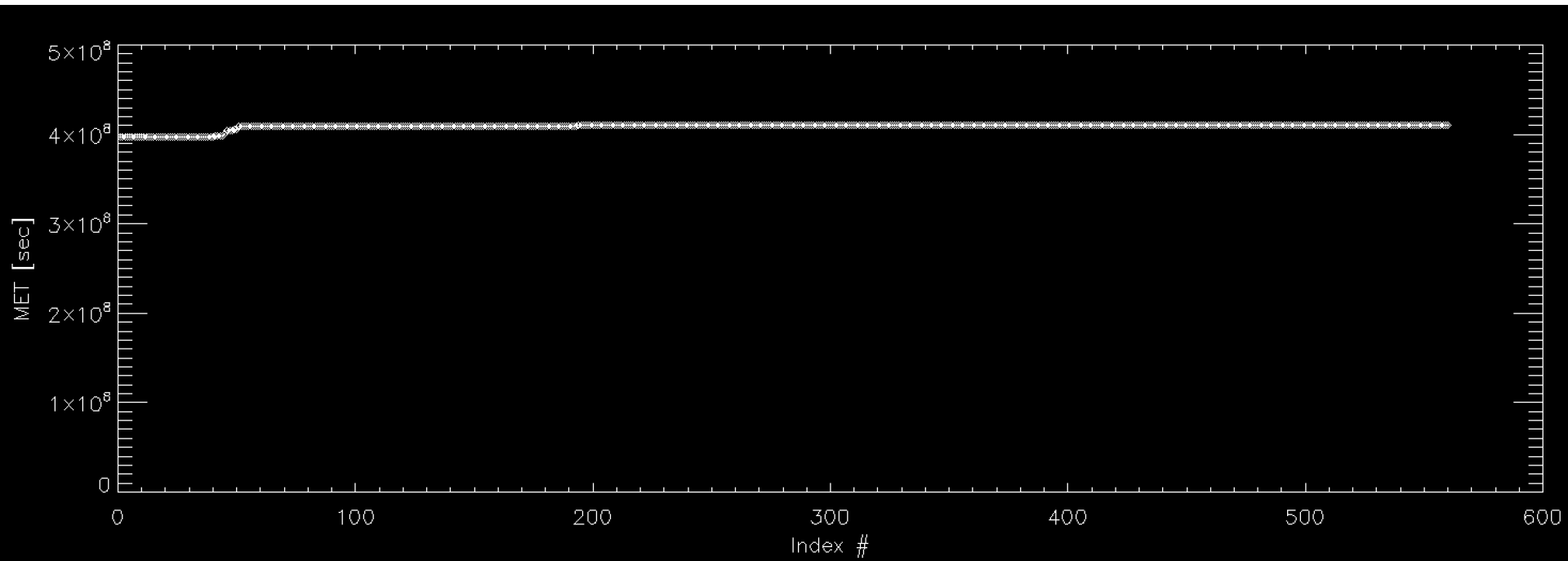■ Time Stamp

Display Table

Select All

Clear All

Cancel

Help

Includes SDC raw scientific data, SDC housekeeping (engineering telemetry), New Horizons spacecraft housekeeping (0x004, 0x00D, 0x00A), and New Horizons thruster firing fata

The SDC raw scientific data includes channel (detector) number, data threshold, data magnitude, and time stamp

5

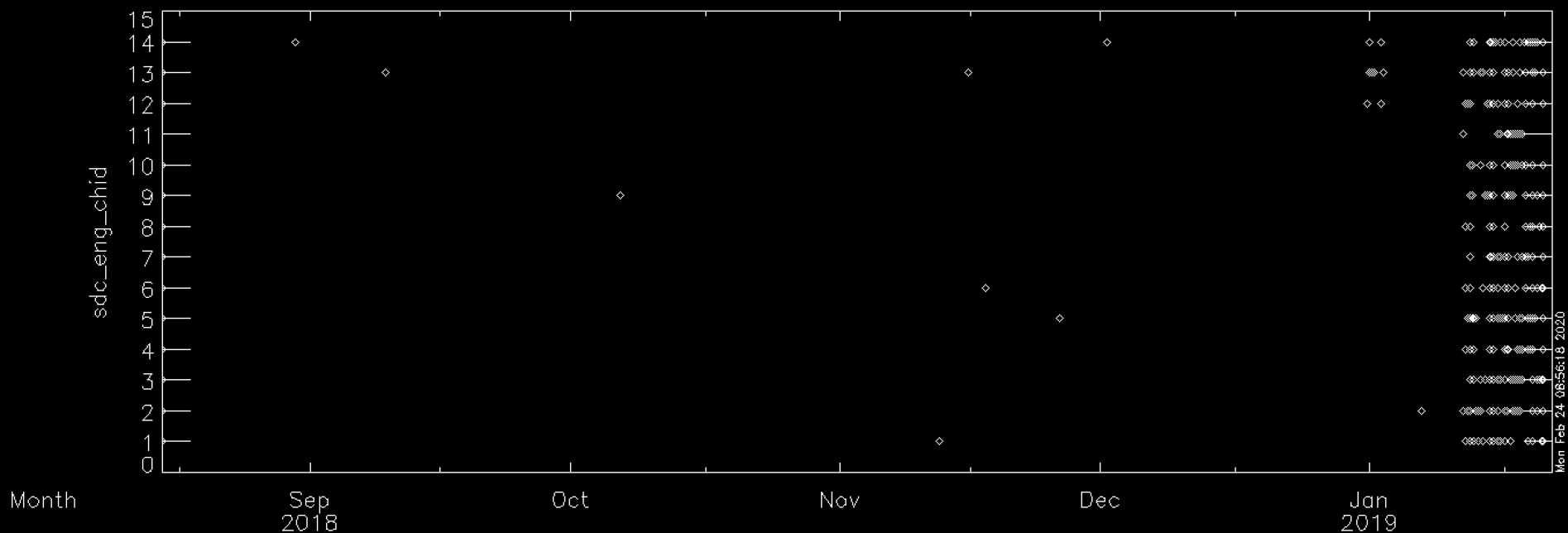# KEM Encounter: SDC Raw Data

Plot of Mission Elapsed Time vs. entry looks good

Total number of events: 561

Time period covers: Aug 15, 2018 – Jan 21, 2019
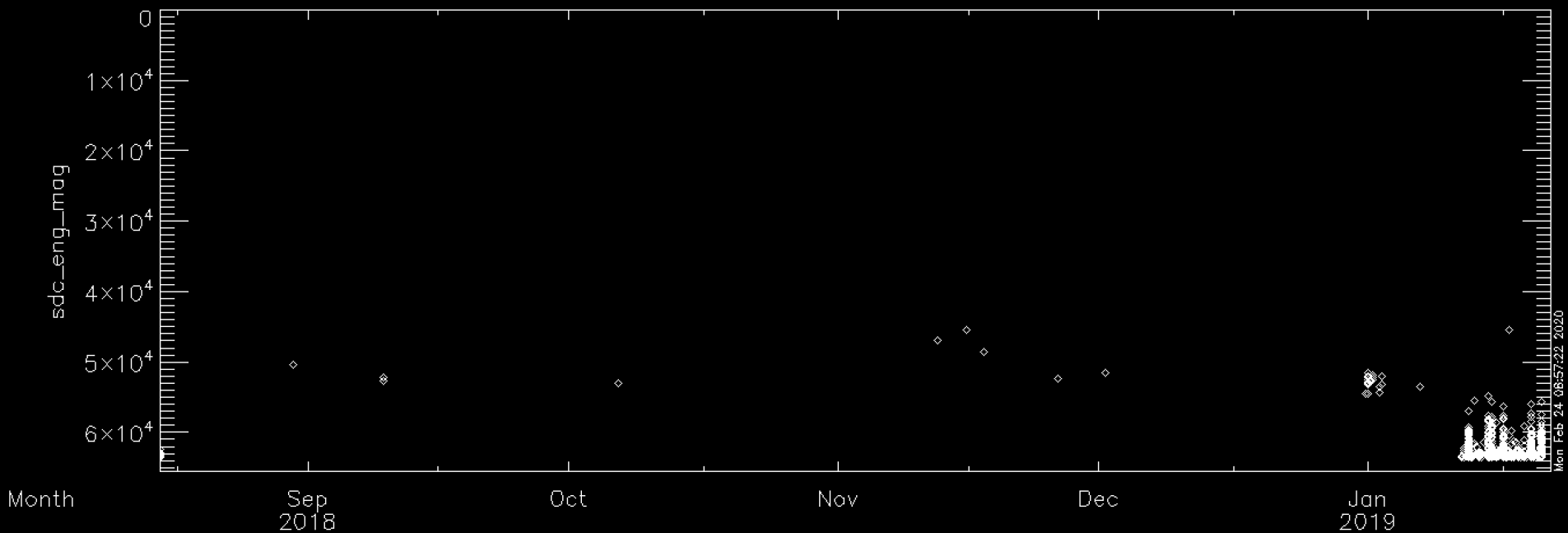
KEM Encounter: SDC Raw Data

Channel ID# versus Time looks good
    Very few hits leading up to Jan 1 encounter as expected from high thresholds

Total number of events: 561

Time period covers: Aug 15, 2018 – Jan 21, 2019

KEM Encounter: SDC Raw Data

Magnitude versus Time looks good
    Very few hits leading up to Jan 1 encounter as expected from high thresholds

Total number of events: 561

Time period covers: Aug 15, 2018 – Jan 21, 2019

KEM Encounter: SDC Calibrated Data

Index	Extension	Type	Dimension	View				
☐ 0	Primary	Image	0	Header	Image		Table	
■ 1	CALIBRATED_DATA	Binary	10 cols X 32 rows	Header	Hist	Plot	All	Select

Total Columns: 10
Total Rows   : 32

Selected columns for display

- ■ UTC_TIME
- ■ MET
- ■ CHANNEL
- ■ CHARGE
- ■ MASS
- ■ MASS_THRSH
- ■ M_SIGPLUS
- ■ M_SIGMINUS
- ■ QUALITY_FLAG
- ■ IMP_VEL

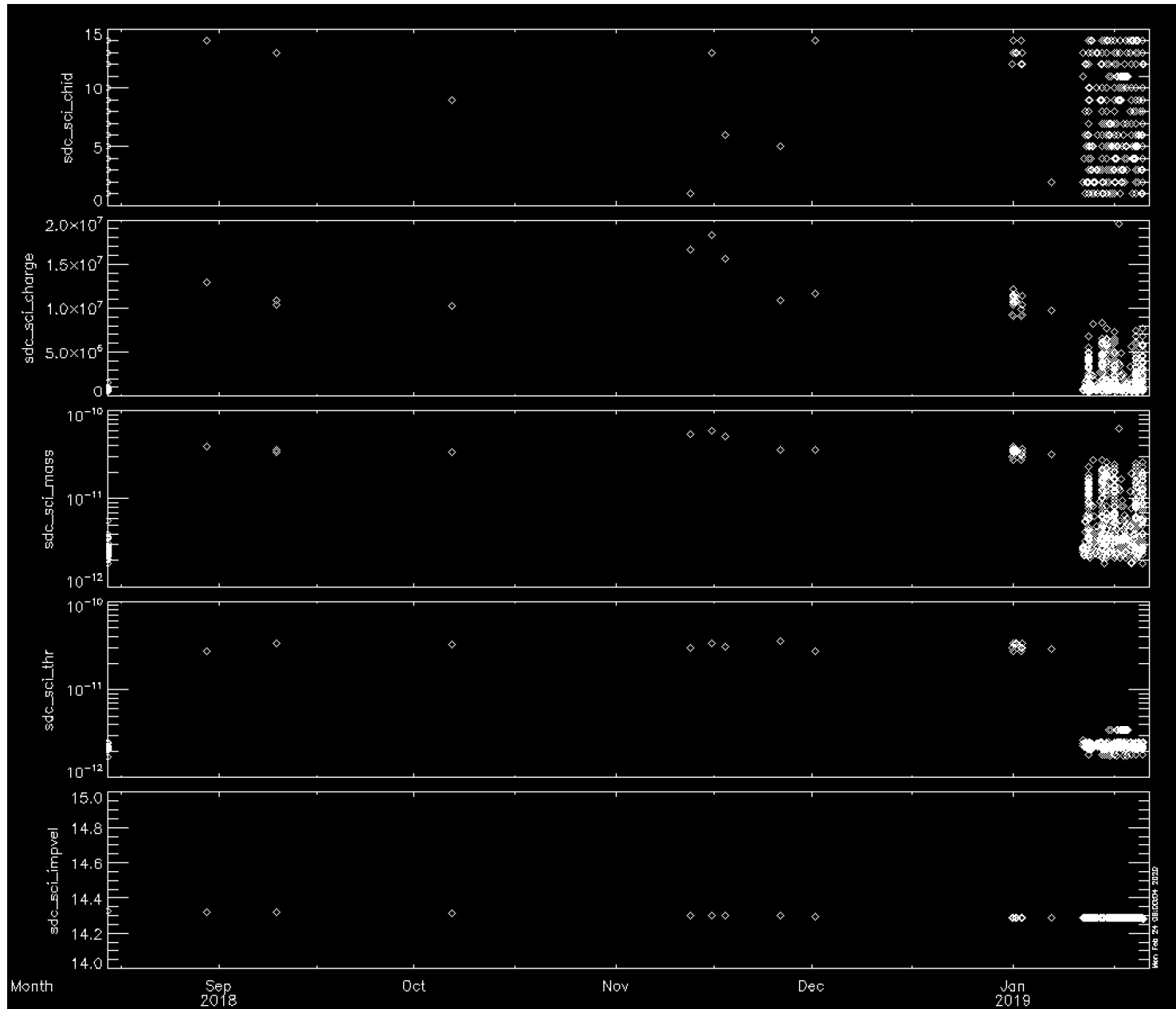Display Table

Select All

Clear All

Cancel

Help

Includes SDC calibrated scientific data

The SDC calibrated scientific data includes time, channel, charge, mass, mass threshold, error bars, quality flag, and theoretical SDC-dust relative impact velocity

KEM Encounter: SDC Calibrated Data

Completeness:

- The delivered dataset has a complete set of files and documentation
- Adequate completeness of each data record (i.e., one dust hit)

Intelligibility:

- Documentation is adequate and straightforward
- SDC data are intelligibly formatted through FITS files, both raw and calibrated
- Metadata are straightforward through ASCII implementation

Interpretability:

- Given the relatively simple nature of SDC operations, the data are straightforwardly interpretable; no issues noted here

Issues:
- None noted