

SDC PDS Review

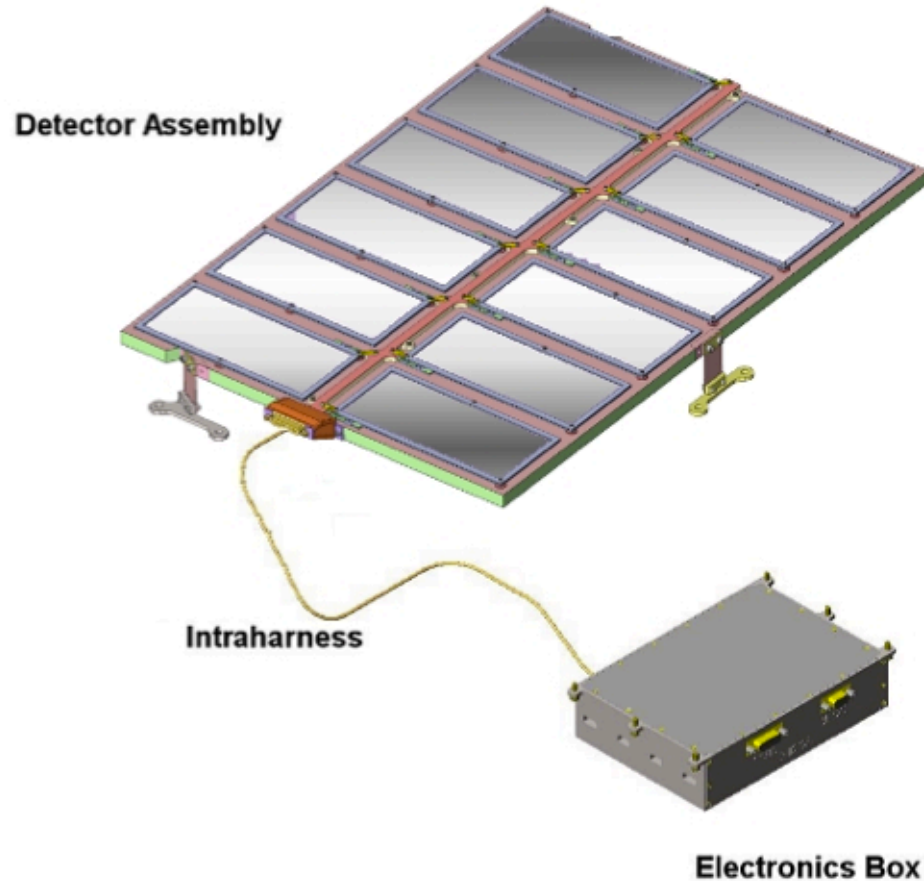
KEM Encounter Data:
2018-08-14 to 2020-03-20

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U.C. Berkeley

December 2, 2020

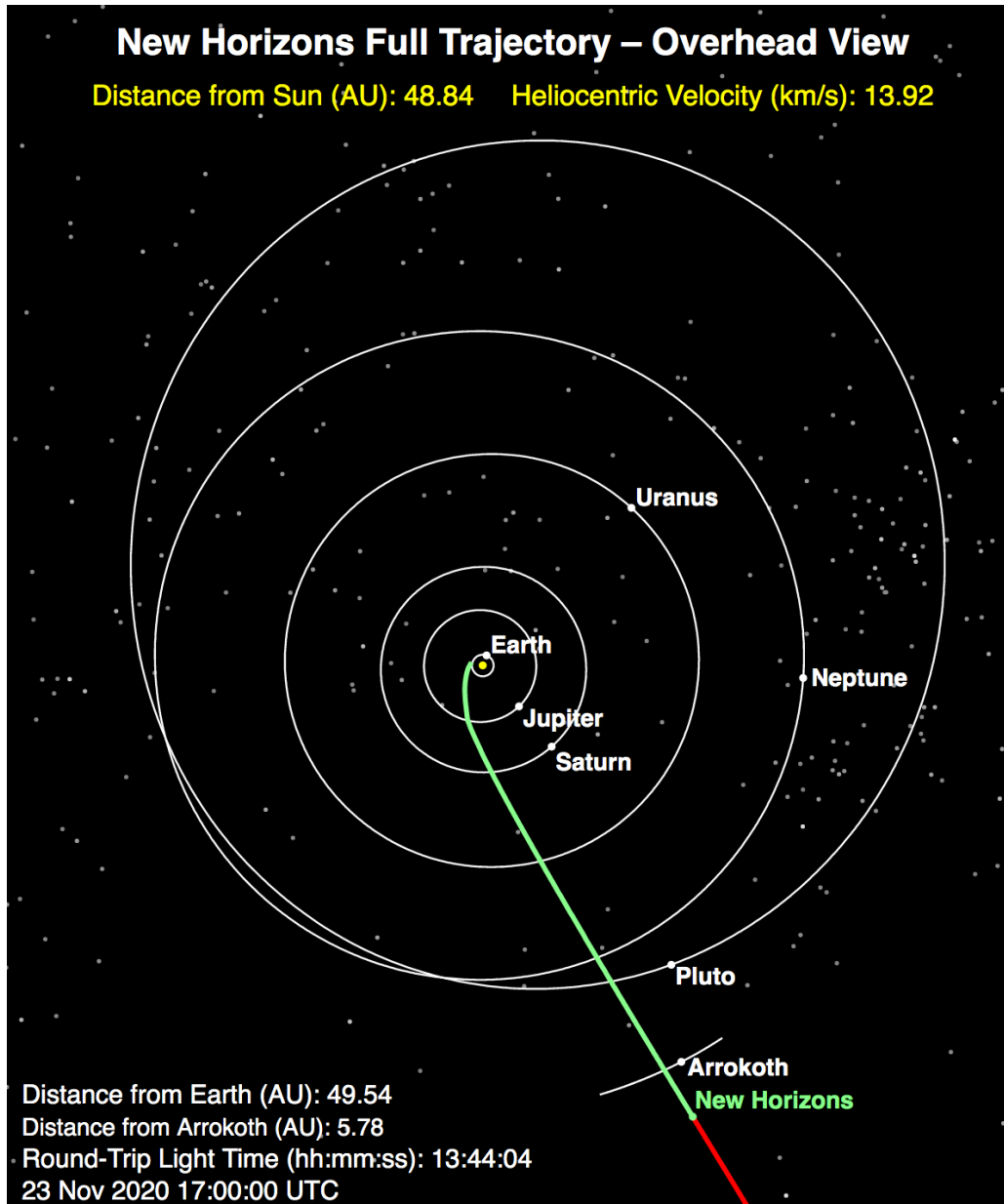
SDC Instrument



SDC instrument:

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

Current Release



Current dataset:

- KEM Encounter
- Aug 2018 to March 2020

KEM Encounter: SDC Raw Data

Index	Extension	Type	Dimension	View				
<input type="checkbox"/> 0	Primary	Image	0	Header	Image	Table		
<input type="checkbox"/> 1	DATA	Binary	6 cols X 32 rows	Header	Hist	Plot	All	Select
<input type="checkbox"/> 2	HOUSEKEEPING_SDC	Binary	9 cols X 0 rows	Header	Hist	Plot	All	Select
<input type="checkbox"/> 3	HOUSEKEEPING_0X004	Binary	37 cols X 1 rows	Header	Hist	Plot	All	Select
<input type="checkbox"/> 4	HOUSEKEEPING_0X00D	Binary	8 cols X 1 rows	Header	Hist	Plot	All	Select
<input type="checkbox"/> 5	HOUSEKEEPING_0X00A	Binary	5 cols X 1 rows	Header	Hist	Plot	All	Select
<input type="checkbox"/> 6	THRUSTERS	Binary	28 cols X 0 rows	Header	Hist	Plot	All	Select

Total Columns: 6
Total Rows : 32

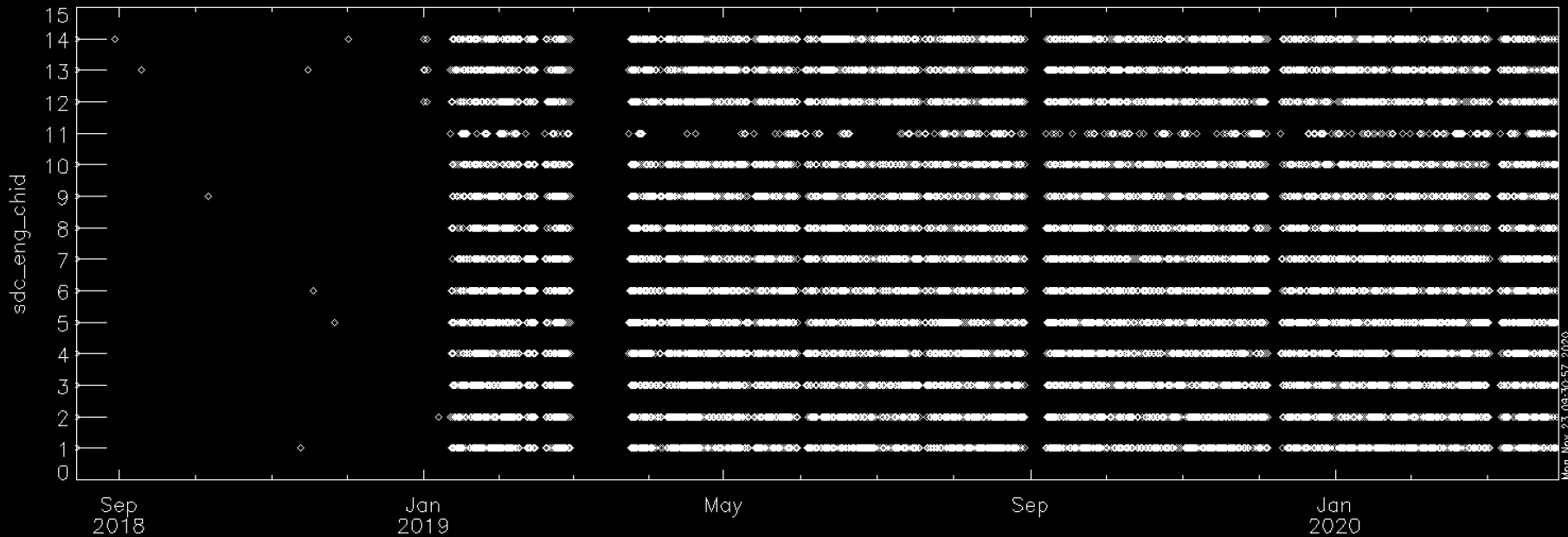
Selected columns for display

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

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

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

KEM Encounter: SDC Raw Data



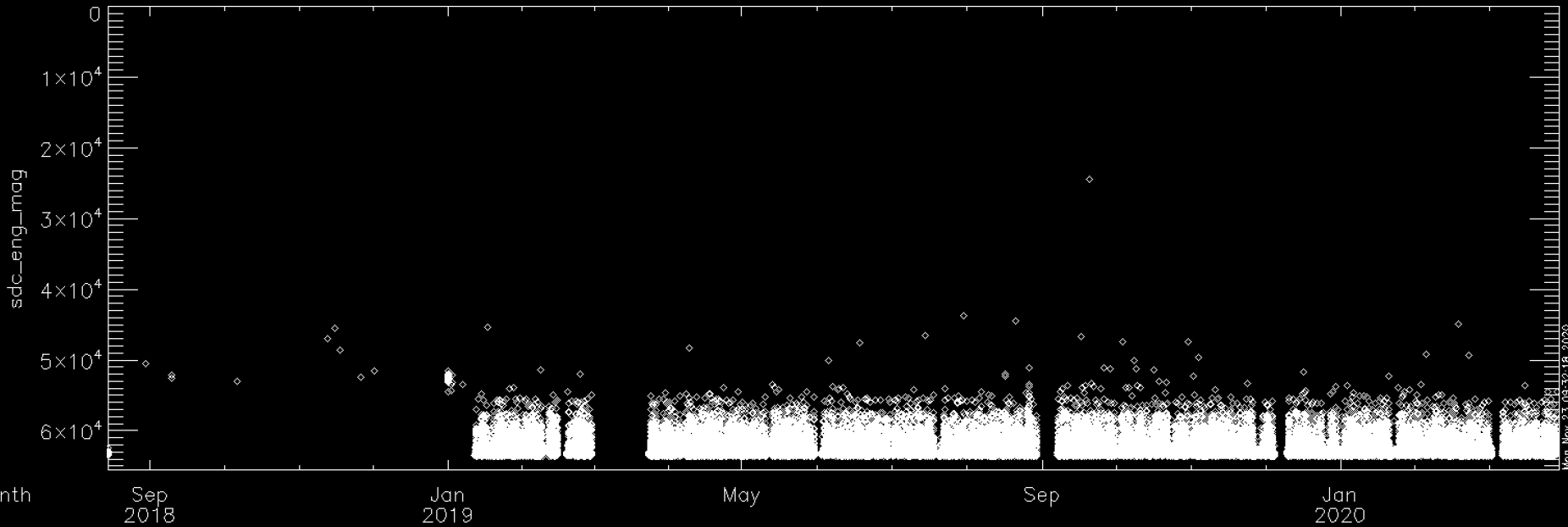
Channel ID# versus Time looks good

Very few hits leading up to Jan 1 encounter as expected from high thresholds
Continued periodic cruise measurements with ACO breaks in counts

Total number of events: 26,651

Time period covers: Aug 15, 2018 – March 29, 2020

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: 26,651

Time period covers: Aug 15, 2018 – March 29, 2020

KEM Encounter: SDC Calibrated Data

Index	Extension	Type	Dimension	View
<input type="checkbox"/> 0	Primary	Image	0	Header Image Table
<input checked="" type="checkbox"/> 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

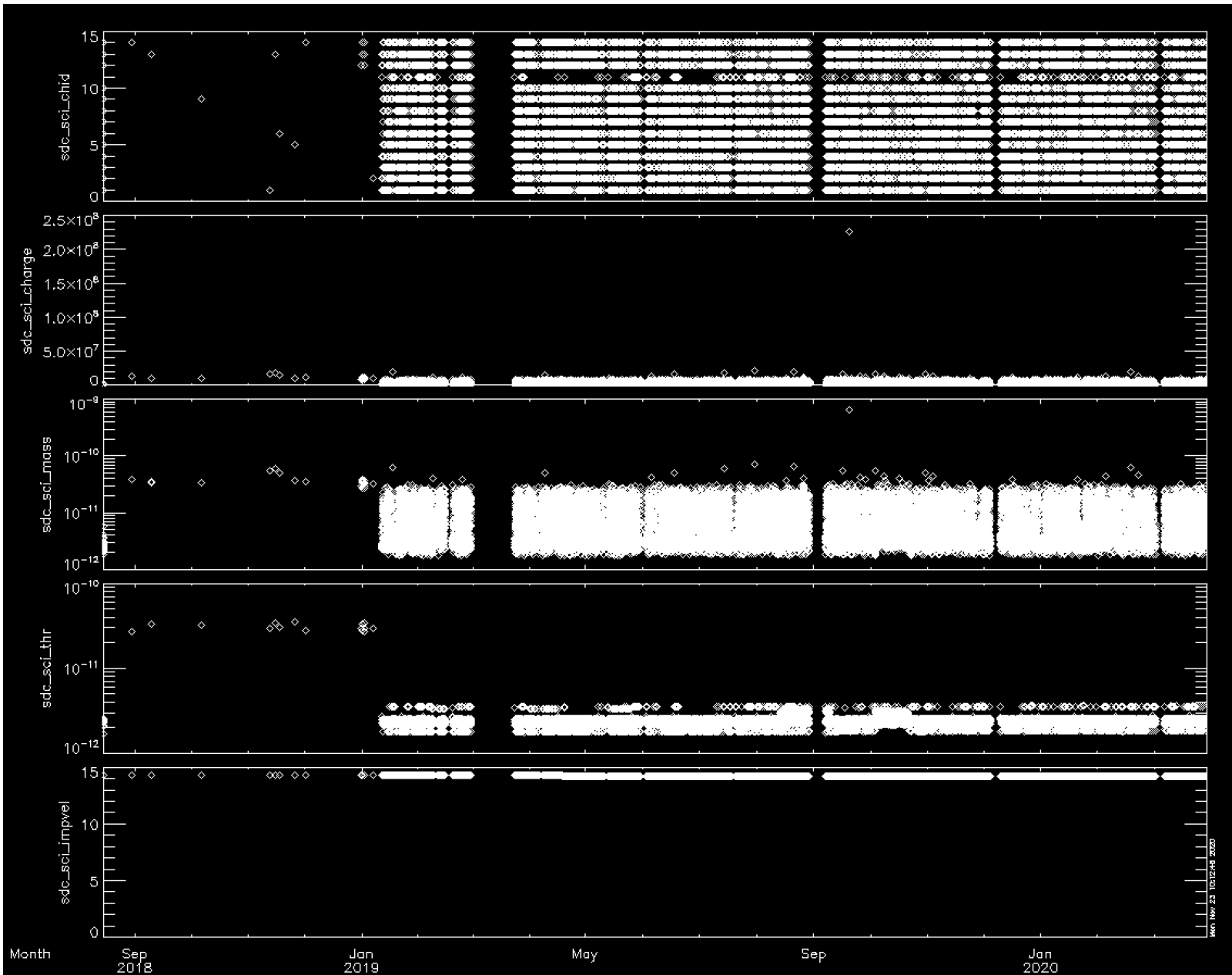
Cancel

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



Minor Issues:

- In the *catalog/* folder, in the section “Mission Phases / The Extended Voyage / KEM 1 Encounter”, ‘zodiacal’ is misspelled as ‘zodial’
- In the *document/* folder, the ‘sdc_stim_v0003.tab’ file was last updated 2019-04-20. Just wanted to double-check if this fully was up to date

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:

- See previous slide