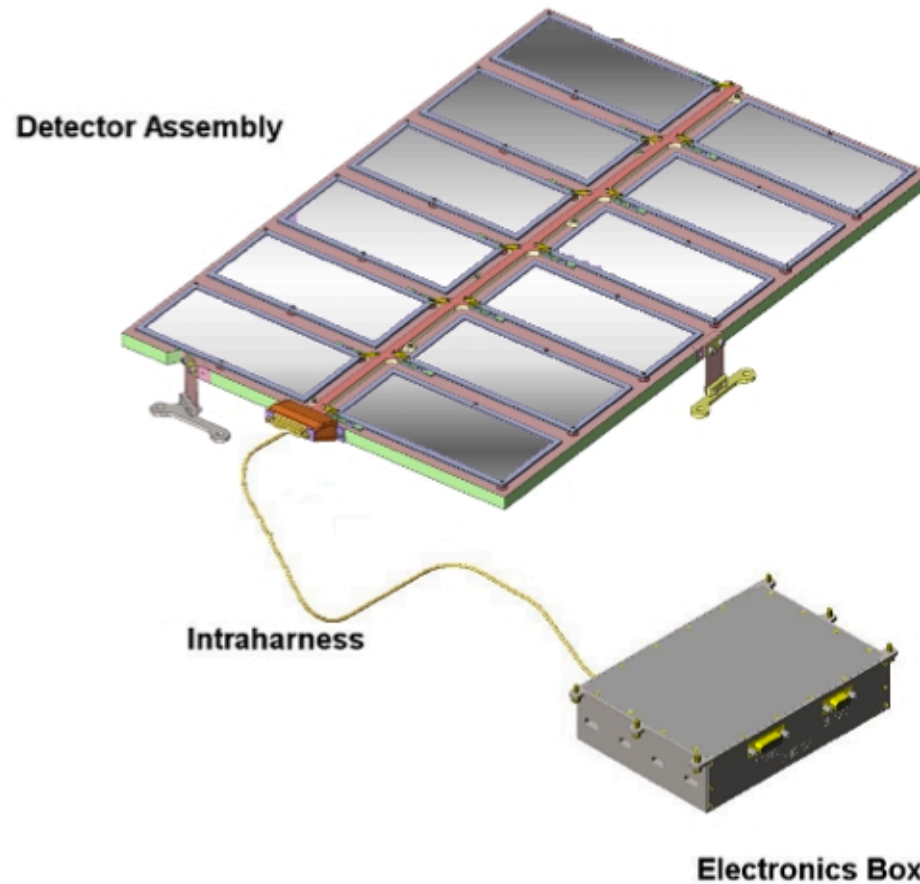


SDC PDS Review

KEM Encounter Data:
2018-08-14 to 2021-02-06

A.R. Poppe
U.C. Berkeley
February 10, 2020

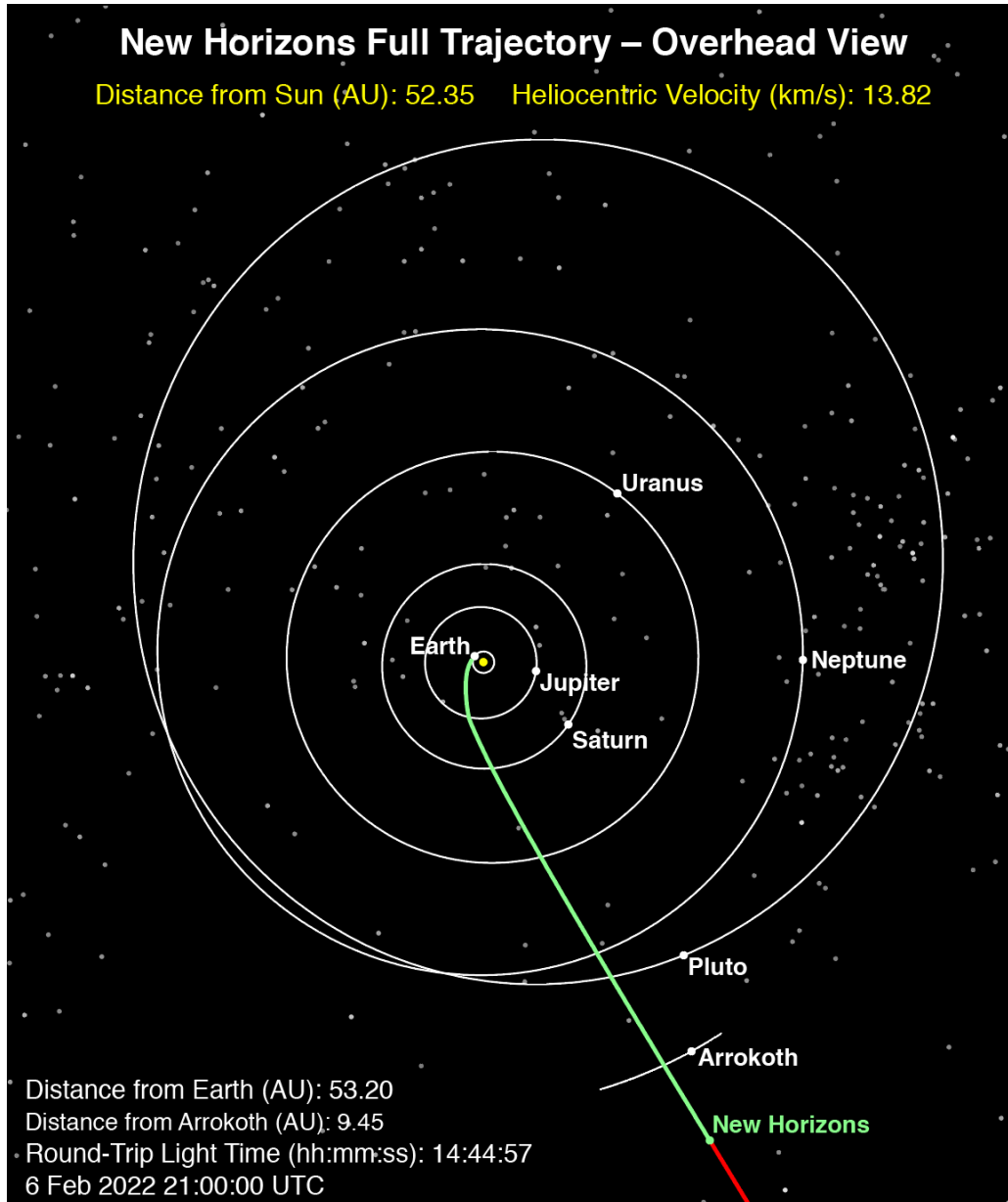
SDC Instrument



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 Feb 2021

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

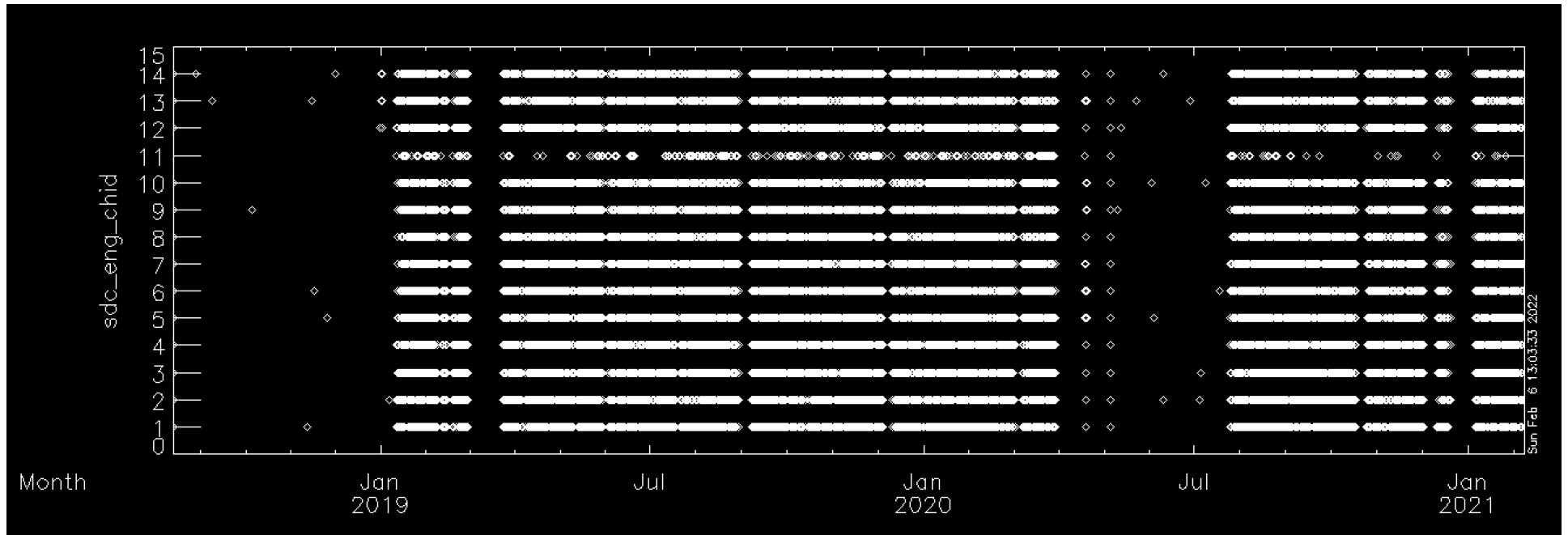
Selected columns for display

- 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

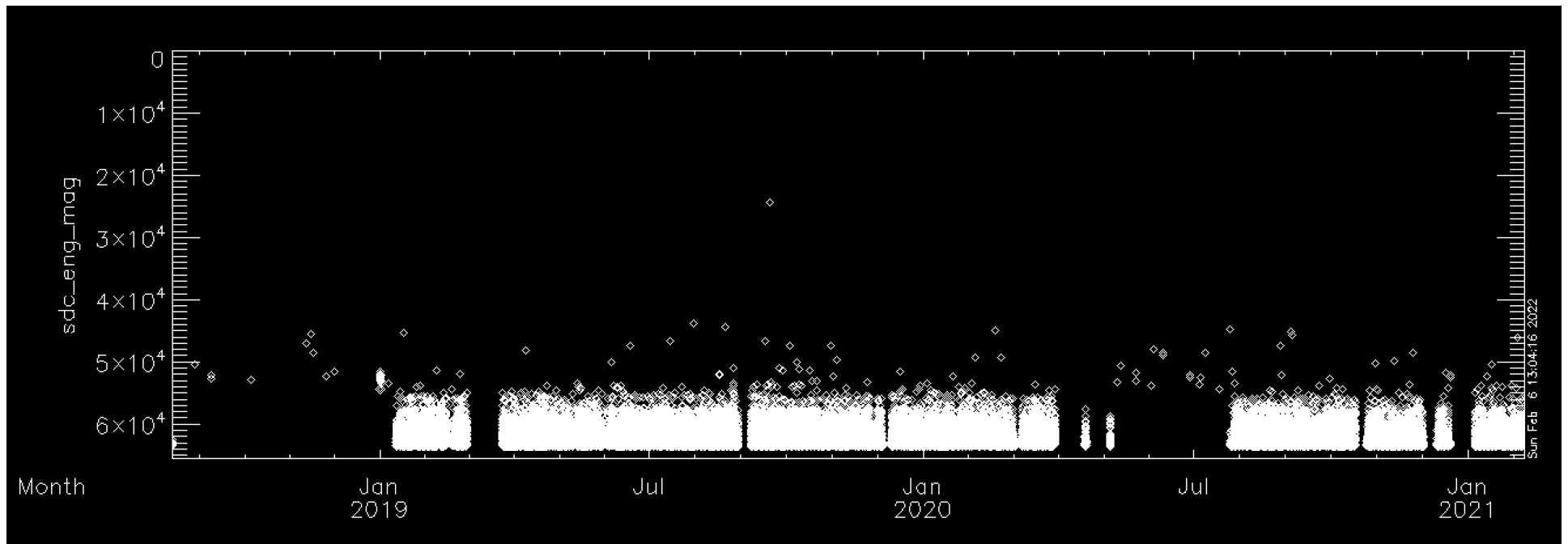
Very few hits leading up to Jan 1 encounter as expected from high thresholds

Continued periodic cruise measurements with ACO breaks in counts (Apr-Jul 2020)

Total number of events: 36,355

Time period covers: Aug 15, 2018 – Feb 6, 2021

KEM Encounter: SDC Raw Data



Magnitude 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 (Apr-Jul 2020)

Total number of events: 36,355

Time period covers: Aug 15, 2018 – Feb 6, 2021

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

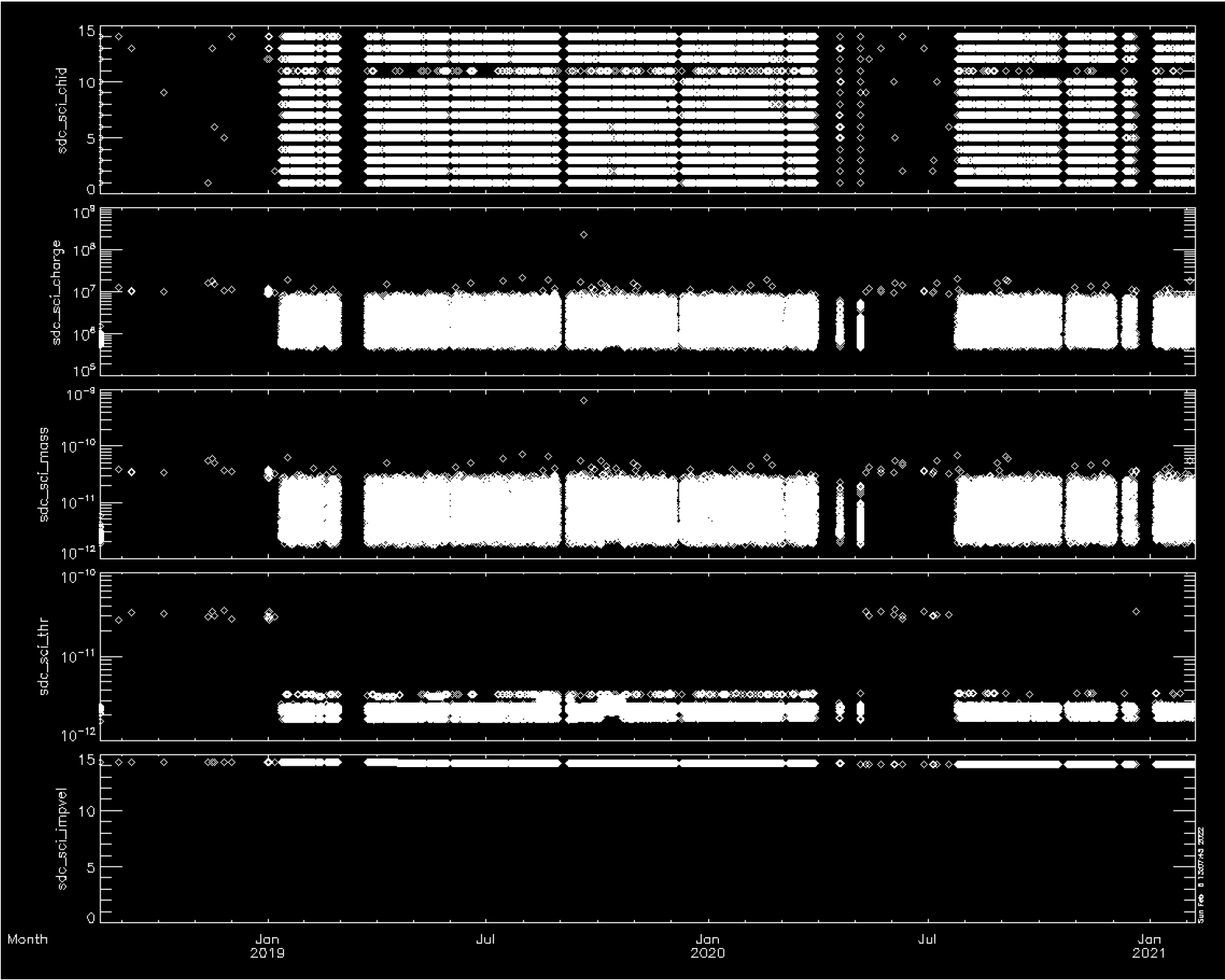
Cancel

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 *document/* folder, the file “sdc_on_off_cmd_v0003.tab” has not been updated to 2021-02-06 (the last entry is ~2020-01-06)

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 (minor):

- See previous slide