THEMIS> help, !istp, /struct

\*\* Structure RETRIEVE\_STRUCT, 20 tags, length=80, data length=74:

INIT INT 1

LOCAL\_DATA\_DIR STRING 'c:/data/istp/'

REMOTE\_DATA\_DIR STRING 'http://cdaweb.gsfc.nasa.gov/istp\_public/data/'

PROGRESS INT 1

USER\_AGENT STRING 'FILE\_RETRIEVE: IDL7.1.1 Win32/x86 (lovetrue)'

FILE\_MODE INT 438

DIR\_MODE INT 511

PRESERVE\_MTIME INT 1

PROGOBJ OBJREF <NullObject>

MIN\_AGE\_LIMIT LONG 900

NO\_SERVER INT 0

NO\_DOWNLOAD INT 0

NO\_UPDATE INT 0

NO\_CLOBBER INT 0

IGNORE\_FILESIZE INT 0

IGNORE\_FILEDATE INT 0

DOWNLOADONLY INT 0

USE\_WGET INT 0

NOWAIT INT 0

VERBOSE INT 2

THEMIS> help, !themis, /struct

\*\* Structure RETRIEVE\_STRUCT, 20 tags, length=80, data length=74:

INIT INT 1

LOCAL\_DATA\_DIR STRING 'c:/data/'

REMOTE\_DATA\_DIR STRING 'http://themis.ssl.berkeley.edu/data/themis/'

PROGRESS INT 1

USER\_AGENT STRING 'FILE\_RETRIEVE: IDL7.1.1 Win32/x86 (lovetrue)'

FILE\_MODE INT 438

DIR\_MODE INT 511

PRESERVE\_MTIME INT 1

PROGOBJ OBJREF <NullObject>

MIN\_AGE\_LIMIT LONG 30

NO\_SERVER INT 0

NO\_DOWNLOAD INT 0

NO\_UPDATE INT 0

NO\_CLOBBER INT 0

IGNORE\_FILESIZE INT 0

IGNORE\_FILEDATE INT 0

DOWNLOADONLY INT 0

USE\_WGET INT 0

NOWAIT INT 0

VERBOSE INT 2

THEMIS> help, tplot\_vars, /struct

\*\* Structure <68e6238>, 2 tags, length=5376, data length=5334, refs=1:

OPTIONS STRUCT -> <Anonymous> Array[1]

SETTINGS STRUCT -> <Anonymous> Array[1]

THEMIS> help, tplot\_vars.OPTIONS, /struct

\*\* Structure <6e645f0>, 13 tags, length=120, data length=114, refs=3:

TRANGE\_FULL DOUBLE Array[2]

TRANGE DOUBLE Array[2]

REFDATE STRING '2008-07-02'

WINDOW INT 0

WSHOW INT 1

VERBOSE INT 1

YGAP FLOAT 0.500000

LAZY\_YTITLE INT 1

NO\_INTERP INT 1

DATANAMES STRING 'thc\_ifoot\_gsm pos\_clipped'

VARNAMES STRING Array[2]

XMARGIN LONG Array[2]

TITLE STRING 'Themis C position & footprints'

THEMIS> help, tplot\_vars.SETTINGS, /struct

\*\* Structure <69fb9a8>, 11 tags, length=5256, data length=5220, refs=2:

TRANGE\_CUR DOUBLE Array[2]

TRANGE\_OLD DOUBLE Array[2]

Y STRUCT -> !AXIS Array[2]

CLIP LONG Array[6, 2]

VARNAMES STRING Array[2]

D STRUCT -> !DEVICE Array[1]

P STRUCT -> !PLT Array[1]

X STRUCT -> !AXIS Array[1]

WINDOW LONG 0

TIME\_SCALE FLOAT 1.00000

TIME\_OFFSET DOUBLE 1.2150000e+009

THEMIS> help, data\_quants, /struct

\*\* Structure TPLOT\_QUANT, 7 tags, length=56, data length=50:

NAME STRING ''

DH POINTER <NullPointer>

LH POINTER <NullPointer>

DL POINTER <NullPointer>

TRANGE DOUBLE Array[2]

DTYPE INT 0

CREATE\_TIME DOUBLE 0.00000000

THEMIS> tplot\_quan = data\_quants[1]

THEMIS> help, tplot\_quan, /struct

\*\* Structure TPLOT\_QUANT, 7 tags, length=56, data length=50:

NAME STRING 'thc\_state\_pos'

DH POINTER <PtrHeapVar807>

LH POINTER <PtrHeapVar808>

DL POINTER <PtrHeapVar809>

TRANGE DOUBLE Array[2]

DTYPE INT 1

CREATE\_TIME DOUBLE 1.3051327e+009

THEMIS> help, \*tplot\_quan.DH, /struct

\*\* Structure <3e489e0>, 3 tags, length=12, data length=12, refs=1:

X POINTER <PtrHeapVar1033>

Y POINTER <PtrHeapVar1034>

V POINTER <PtrHeapVar1035>

THEMIS> help, \*tplot\_quan.DL, /struct

\*\* Structure <3d3e6e0>, 7 tags, length=640, data length=636, refs=1:

CDF STRUCT -> <Anonymous> Array[1]

SPEC BYTE 0

LOG BYTE 0

DATA\_ATT STRUCT -> <Anonymous> Array[1]

COLORS INT Array[3]

LABELS STRING Array[3]

YSUBTITLE STRING '[km]'

THEMIS> help, (\*tplot\_quan.DL).CDF, /struct

\*\* Structure <47e0c98>, 4 tags, length=544, data length=544, refs=2:

FILENAME STRING 'C:\data\themis\thc\l1\state\2007\thc\_l1\_state\_20070323'

GATT STRUCT -> <Anonymous> Array[1]

VNAME STRING 'thc\_pos'

VATT STRUCT -> <Anonymous> Array[1]

THEMIS> help, ((\*tplot\_quan.DL).CDF).gatt, /struct

\*\* Structure <3e8daa0>, 25 tags, length=324, data length=324, refs=3:

PROJECT STRING 'THEMIS'

SOURCE\_NAME STRING 'THC>THEMIS Probe C'

DISCIPLINE STRING Array[2]

DATA\_TYPE STRING 'STATE>State file'

DESCRIPTOR STRING 'L1>L1 DATA'

DATA\_VERSION STRING '03'

PI\_NAME STRING 'V. Angelopoulos'

PI\_AFFILIATION STRING 'UCB, NASA NAS5-02099'

TEXT STRING 'Produced by Mission Ops, Science Ops and Science Team..V00: Predictive on all, pre-p'...

INSTRUMENT\_TYPE STRING Array[2]

MISSION\_GROUP STRING 'THEMIS'

LOGICAL\_SOURCE STRING 'thc\_l1\_state'

LOGICAL\_FILE\_ID STRING 'thc\_l1\_state\_20070323\_v02'

LOGICAL\_SOURCE\_DESCRIPTION

STRING 'Probe state file, contains position, attitude, sun pulse data'

TIME\_RESOLUTION STRING '1min, typical (3s occasional)'

RULES\_OF\_USE STRING 'Open Data for Scientific Use'

GENERATED\_BY STRING 'THEMIS SOC'

GENERATION\_DATE STRING '2010-05-13'

ACKNOWLEDGEMENT STRING 'NASA Contract NAS5-02099'

MODS STRING 'Rev- 2008-04-09'

ADID\_REF STRING 'NSSD0110'

LINK\_TEXT STRING 'http://sprg.ssl.berkeley.edu/themis'

LINK\_TITLE STRING 'THEMIS probe state file'

HTTP\_LINK STRING 'http://sprg.ssl.berkeley.edu/themis'

FILE\_NAMING\_CONVENTION

STRING 'source\_descriptor\_datatype'

THEMIS> help, ((\*tplot\_quan.DL).CDF).vatt, /struct

\*\* Structure <47e0998>, 17 tags, length=196, data length=196, refs=2:

CATDESC STRING 'thc\_position'

DEPEND\_0 STRING 'thc\_state\_epoch'

DEPEND\_1 STRING 'thc\_pos\_compno'

DISPLAY\_TYPE STRING 'time\_series'

FIELDNAM STRING 'thc\_pos'

FILLVAL FLOAT NaN

FORMAT STRING 'F12.8'

LABL\_PTR\_1 STRING 'thc\_pos\_labl'

UNIT\_PTR STRING 'thc\_pos\_unit'

VALIDMIN FLOAT Array[3]

VALIDMAX FLOAT Array[3]

VAR\_TYPE STRING 'data'

COORDINATE\_SYSTEM

STRING 'GEI'

REPRESENTATION\_1

STRING 'Rep\_xyz\_gei'

TENSOR\_ORDER STRING '1'

DEPEND\_TIME STRING 'thc\_state\_time'

DEPEND\_EPOCH0 STRING 'thc\_state\_epoch0'

IDL> help, par, /struct

\*\* Structure <42bf438>, 2 tags, length=785752, data length=785752, refs=1:

X DOUBLE Array[8929]

Y DOUBLE Array[8929, 10]

par = {x:ntimes,y:[[pram],[dst],[imf\_y],[imf\_z],[dblarr(n)],[dblarr(n)],[dblarr(n)],[dblarr(n)],[dblarr(n)],[dblarr(n)]]}

pram = 1.667e-6\*den\*spd^2