Cryosat-2 POD validation activity

Ernst Schrama TU Delft
CryoSat-2 POD validation activity

• Data from ESA
  – DORIS diode navigator files
  – Star tracker quaternion files
  – Spacecraft mass properties file
  – Maneuver data

• Data from the public domain
  – SLR data from CDDIS at NASA and the DGFI in Munich
  – Doris data from the IGN and CDDIS at NASA
  – Two line element data from NORAD
  – Solar radiation flux and geomagnetic data from NGDC at NOAA
  – IERS EOP parameters from the IERS
Quaternions v0 star trackers

• A cron script executes sftp retrieving the data from ESOC (what is the retention period on the ESOC servers?)

• 15 CS_OPER_TLM_SATM* files acquired since April 9

• April 12, 13 and 18 are reasonably complete, the remaining days are truncated within the first hour (is this a software bug)

• Developed software to interpret the telemetry files

• Star tracker to spacecraft frame alignment procedure (Francesco Marchese provided 3 transformation matrices)

• Evaluation of the Cryosat-2 attitude behavior (we need the attitude within 0.3 of a degree for all axes)
Quaternions v1 star trackers

• A cron script executes ftp retrieving the data from ESA

• ~1700 CS_OPER_STR[1-3]ATT* files acquired since April 9

• Developed software to interpret the STR*ATT files

• Star tracker to spacecraft frame alignment procedure (Francesco Marchese provided 3 transformation matrices)

• Evaluation of the Cryosat-2 attitude law
DORIS diode navigator files

- ftp automation to retrieve the data from PDGS
- 15 CS_OPER_AUX_ORBDOP* files retrieved since April 11
- daily files, 1 minute interval data, data flow stopped on April 27
- Developed a Perl tool for interpreting the xml files which contain the Doris diode orbits.
- Ground track plotting (useful for orbit planning in WP 530)
- Attitude law validation together with the STR TLM data from ESOC
2003 Fairbanks DORIS residue RMS

Credits: Eelco Doornbos