CNES/CLS Analysis Center (LCA)
Status Report

L. Soudarin[1], H. Capdeville[1], J.-M. Lemoine[2], J.-F. Crétaux[2]

[1] *CLS, Collecte Localisation Satellites, Ramonville, France*
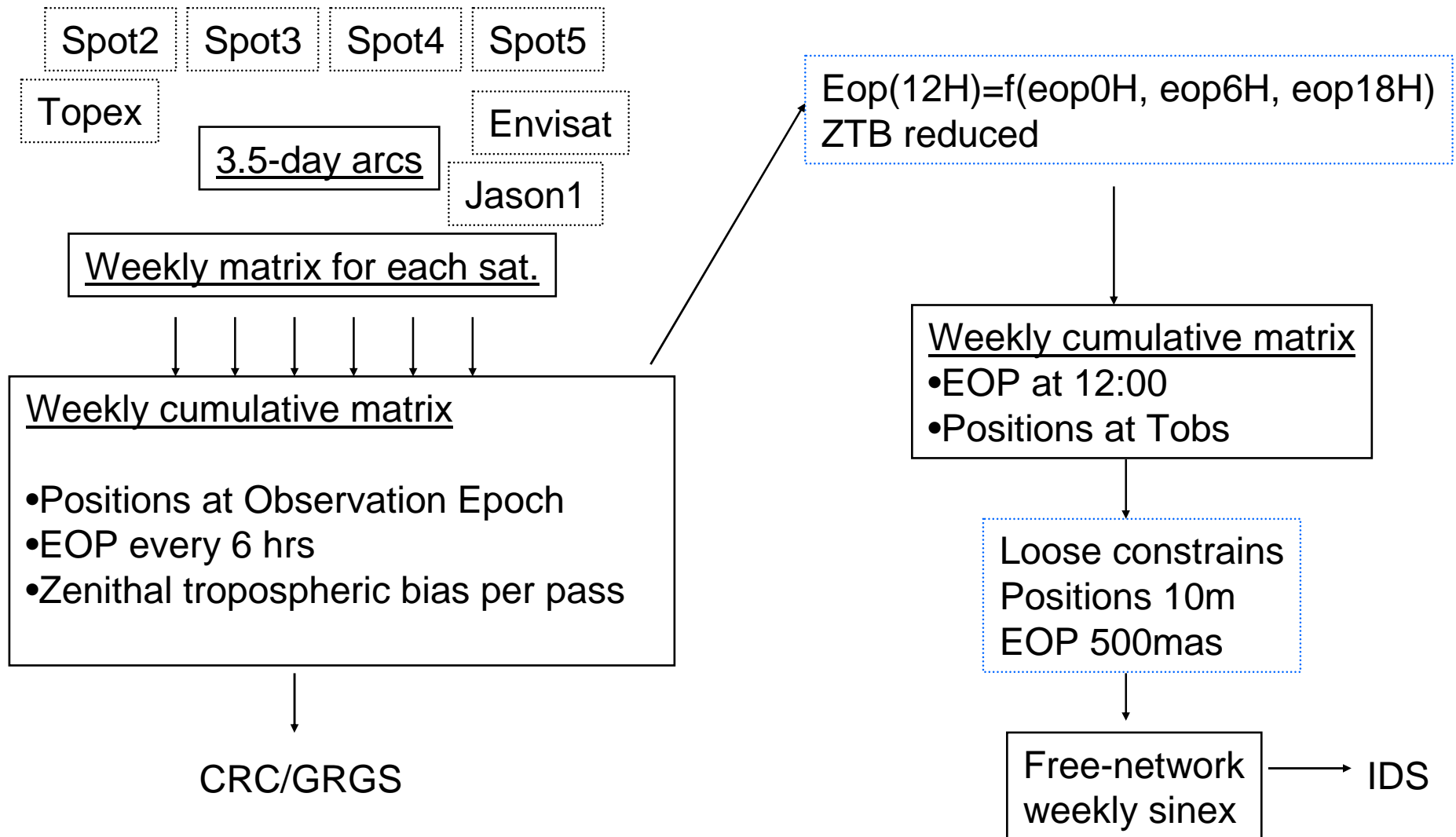
[2] *CNES, Toulouse, France*

Status

DORIS data processing for IDS and GRGS/CRC (Combination Research Center for IERS)

Routine processing suspended in May.

Priority to ITRF2008 contribution:
- definition of standard and modelling
- re-processing 1993-2007

Data Analysis

Spot2　Spot3　Spot4　Spot5

Topex　　　　　　　　Envisat

3.5-day arcs　　　Jason1

Weekly matrix for each sat.

$Eop(12H) = f(eop0H, eop6H, eop18H)$
ZTB reduced

Weekly cumulative matrix

- Positions at Observation Epoch
- EOP every 6 hrs
- Zenithal tropospheric bias per pass

CRC/GRGS

Weekly cumulative matrix
- EOP at 12:00
- Positions at Tobs

Loose constrains
Positions 10m
EOP 500mas

Free-network
weekly sinex　→　IDS

Model and analysis standards (1)

- Gravity field = EIGEN_GL04S_ANNUAL

- Tidal forces :
    - Solid earth: model of IERS2003 conventions
    - Ocean: FES2004 (with admittance)
    - Atmosphere: Biancale&Bode

- Atmospheric gravitational attraction: computed from 6h ECMWF 3D pressure grids over land, inverted barometer model over the ocean

- Atmospheric density = DTM94

- Solar radiation pressure:
    - albedo +IR pressure values interpolated from 6-hour grids from ECMWF

- Satellite Center of Mass – Antenna Phase Center: applied from CDDIS data files

- Satellite physical model = IDS

Model and analysis standards (2)

- Station displacements:
  - atmospheric loading= from 6h ECMWF 3D pressure grids
  - ocean loading= Amplitudes and phases from FES2004
  - Solid earth : Wahr model (IERS Conventions 2003)
  - Pole tide : applied (IERS, 2003)

- Troposphere:
  - After 2002: Dry and wet a priori ZTD interpolated from 6-hour grids derived from ECMWF meteorological model (available from 2002)
  - Before 2002: DORIS met data
  - Mapping function: Guo & Langley

- EOP: a priori EOP05C04 polar motion
- Stations Positions and Velocities: ITRF/DPOD2005
- Arc lengths: 3.5 days
- GINS version 8.2

Participation to ITRF2008

What we have done until now is:

2002-2007:
- new processing of Envisat data
- new weekly series (lcawd19) =
  [new processing] Envisat
+ [previous processing] SPOTs+Topex+Jason(2002)

delivered to J.J. Valette and X. Collilieux

1998-2001 is being analysed

1993-1997 is in progress

Participation to ITRF2008

For the next months, our plan is as follows:

November-December:
-provide IDS with 1993-2001 weekly solutions

January-February:
-re-processing of SPOTs and Topex data over 2002-2007
(+Jason 2002?)
-processing of 2008
-provide IDS with the homogeneous series 2002-2008

Issues

Atmospheric loading
We plan to form the time series of atmospheric loading applied in our processing.
We will thus be able to remove this correction in the normal equations before getting the solution.

Time Varying Gravity field
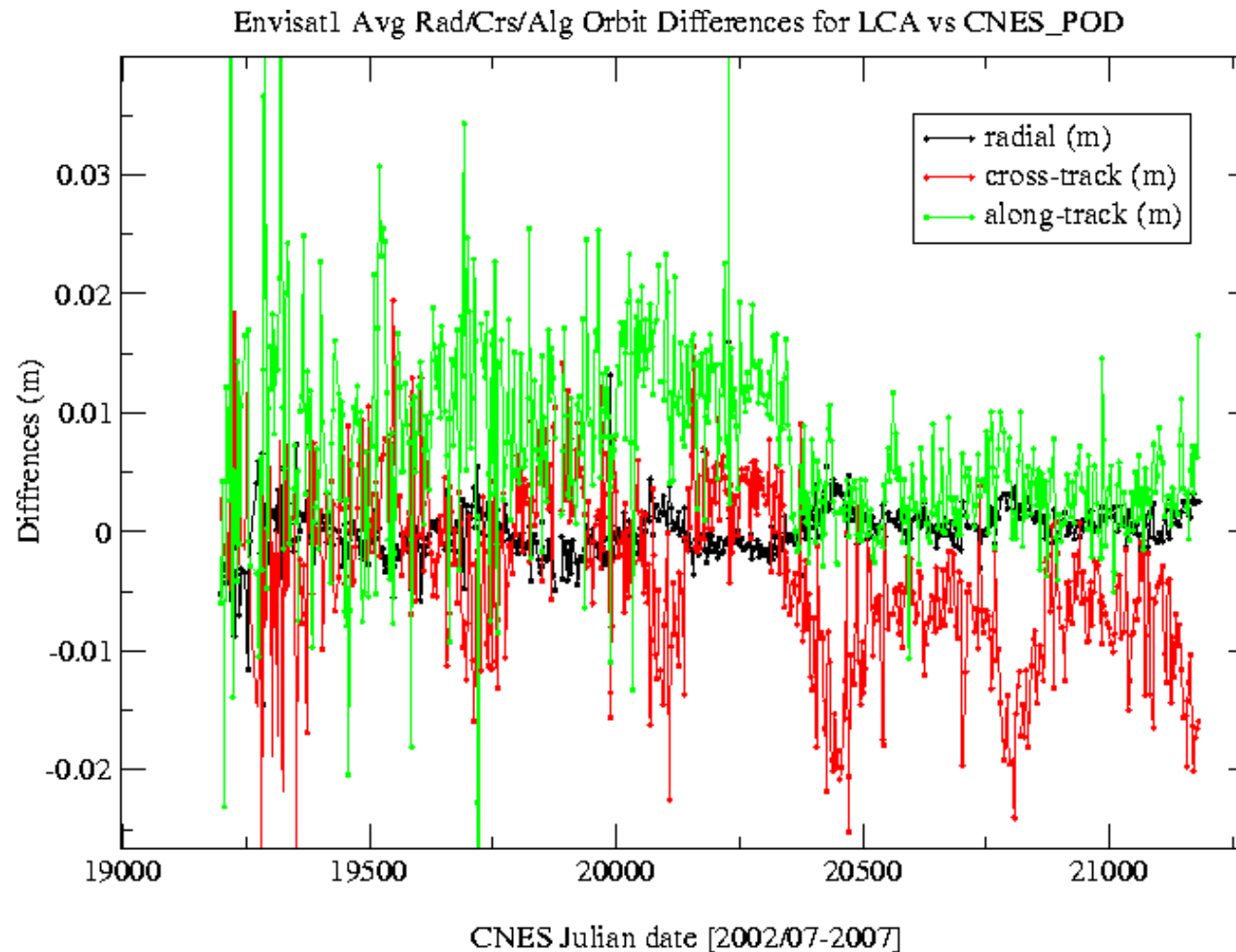We are using the complete EIGEN-GL04S model including time drifts.
However, partial derivatives for the coefficients up to degree 3 are generated in the weekly matrices of each satellite. Thus we may solve these terms or fix them to different values.
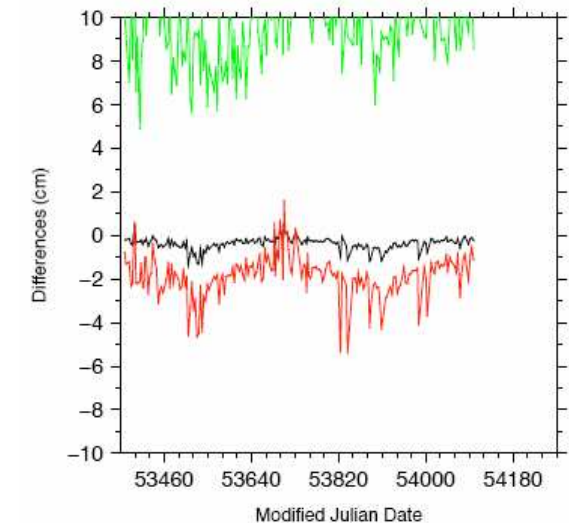
EOP
Only Xp,Yp; approach not changed

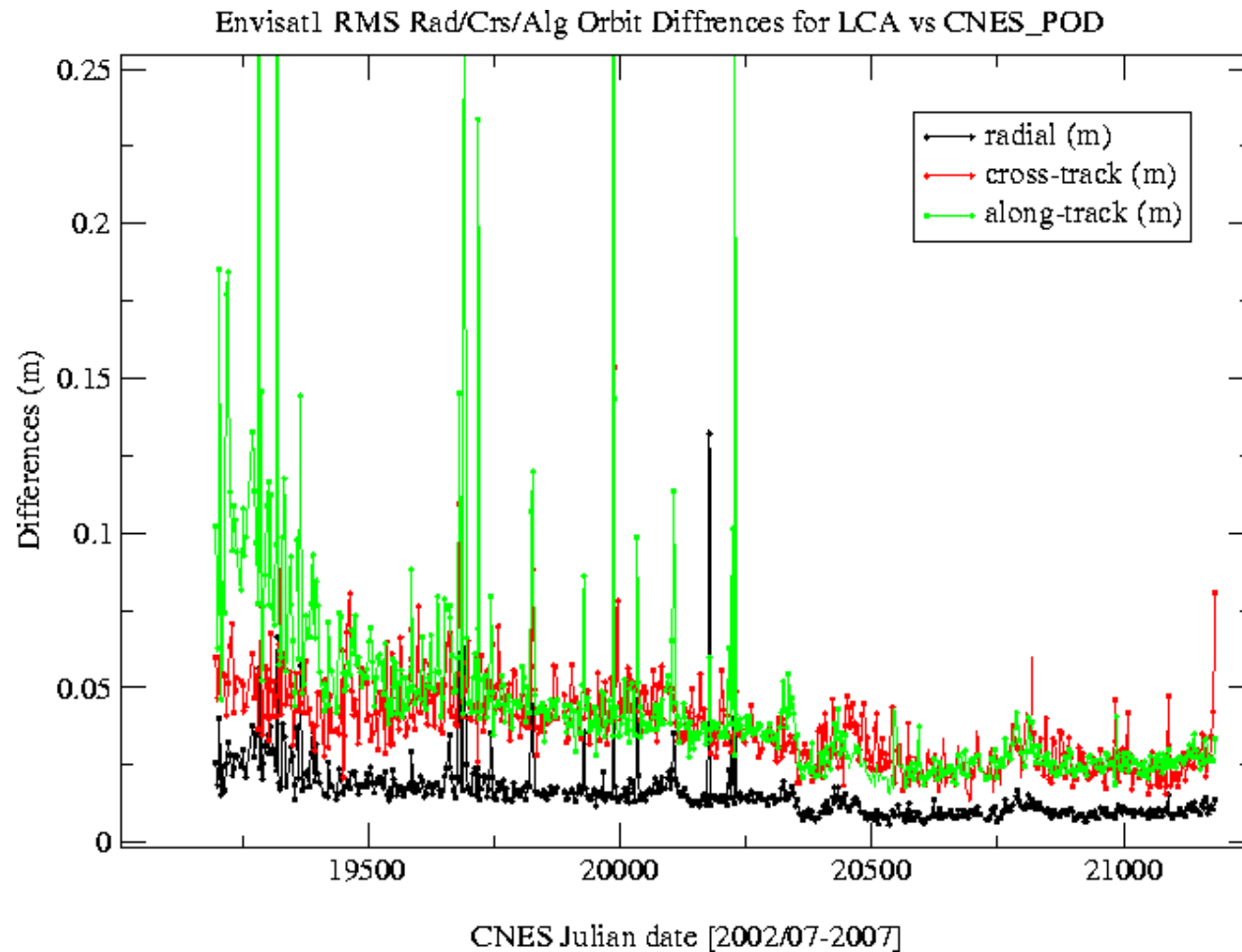# Envisat reprocessing: orbit comparison

LCA vs CNES/POE: average

Envisat1 Avg Rad/Crs/Alg Orbit Differences for LCA vs CNES_POD

Previous series
LCA vs GSFC v2
(F. Lemoine AWG0803)

Envisat reprocessing: orbit comparison

LCA vs CNES/POE: RMS

Envisat1 RMS Rad/Crs/Alg Orbit Diffrences for LCA vs CNES_POD
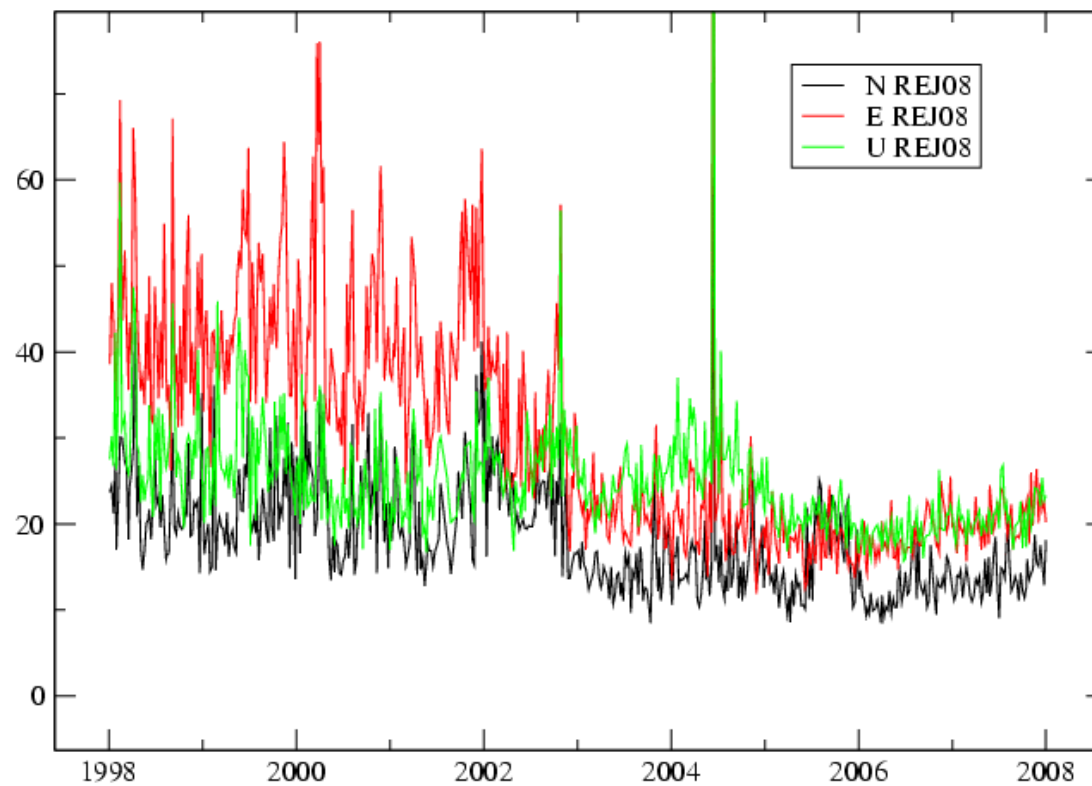
Previous series
LCA vs GSFC v2
(F. Lemoine AWG0803)
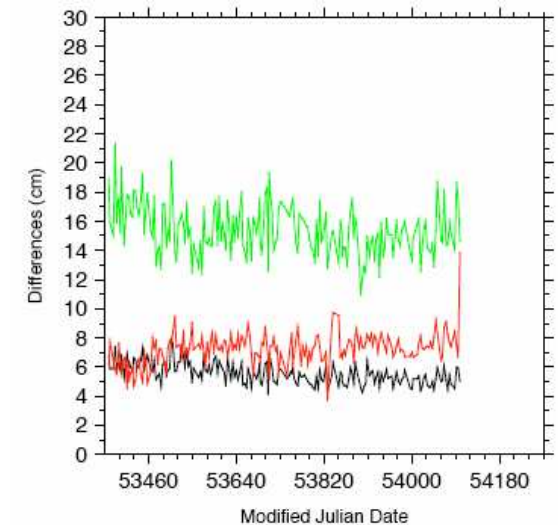
Weekly multi-sat. solutions vs ITRF/DPOD2005

Weekly NEU rms for the whole network 1998-2007

Plan for 2009

After ITRF2008:

• Re-start routine processing

• Process Jason2 DORIS2.2

• Include Jason2 in SINEX solutions for IDS?

Backups

Time varying gravity model EIGEN-GL04S-ANNUAL

Cij(t)= Cij+Drift_Cij*(t-t0)+Annual_Cij(t)+SemiAnnual_Cij(t)

Partials generated for each satellite for :

C20
C21 S21
C22 S22
C30
C31 S31
C32 S32
C33 S33