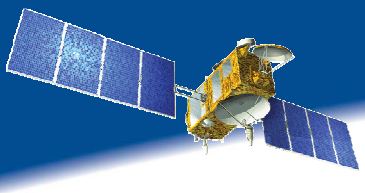
NEAR-REAL-TIME DORIS-ONLY GROUND ORBITS

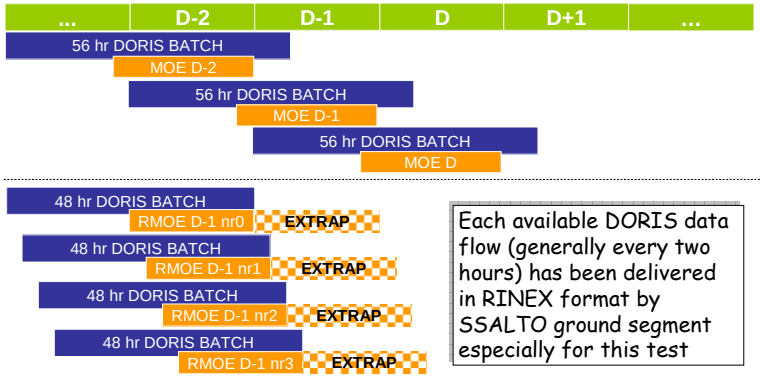
S. Houry[1], S. Rios-Bergantinos[2], L. Cerri[1], A. Couhert[1], F. Mercier[1]
[1]CNES, Toulouse, France
[2]CS, Toulouse, France



Short-latency DORIS-based Jason-2 orbits have been routinely produced on a best-effort basis with an accuracy similar to that of MOE orbits used in IGDR products, but with a delay compatible with the OGDR processing needs. We evaluate the accuracy of these orbits over different time-spans by comparison with independent GPS-based precise orbits.

Introduction

This exercise aimed at verifying the robustness of an **MOE-like orbit solution in a near-real time scenario, on a best-effort basis (with no operational constraints)**. Is the "Rapid MOE" accuracy equivalent to that of the current MOE with a latency compatible with the OGDR production ?



Each available DORIS data flow (generally every two hours) has been delivered in RINEX format by SSALTO ground segment especially for this test

Standard MOE processing scheme:

56 hours batch : [D-2 00:00 , D 08:00]

26 hours delivered ephemeris : [D-2 22:00 , D 00:00]

Rapid MOE processing scheme: based on the last Doris measurement epoch (t_0)

48 hours batch : [t_0-48hr , t_0]

24 hours delivered ephemeris : [t_0-24 hr , t_0]

24 hours delivered extrapolation : [t_0 , t_0 +24hr]

Availability, latency and accuracy

12% of rapid MOEs not available, corresponding to a total of 112 anomalies

- 2 anomalies due to the interruption of MOE processing (non-operational machines)
- 110 due to missing RINEX data

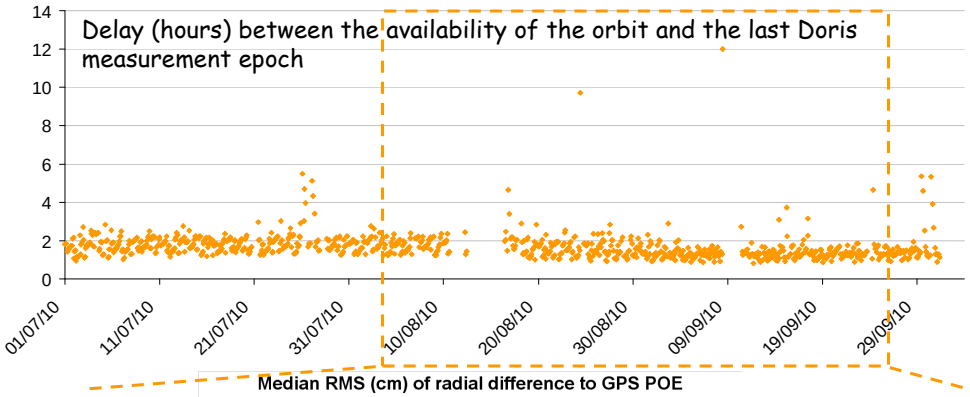
When available, rapid MOE has been delivered

-within 2 hr 80 % of times

-within 4 hr 19 % of times

-after more than 4 hr 1 % of times

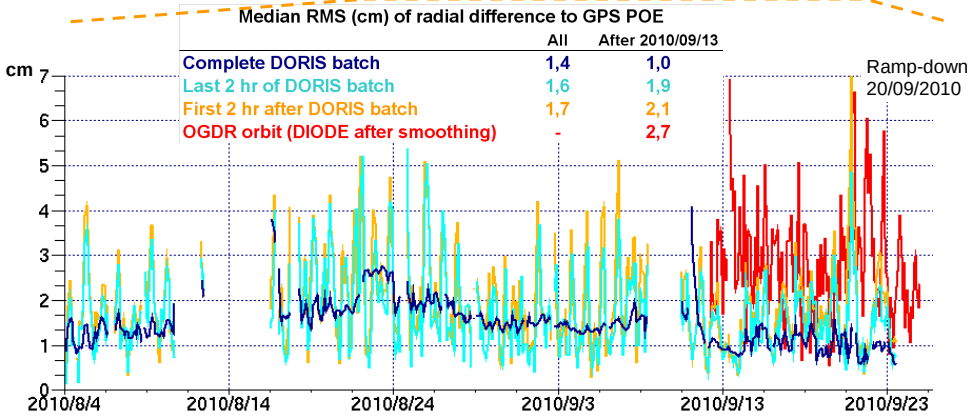
All delays are explained by late RINEX arrival



Radial accuracy is evaluated by comparison with respect to GPS POE (CNES), assumed to have a 1-cm radial accuracy

Radial difference is generally below 2 cm RMS over the 48 hr batch interval and below 3 cm RMS over the last two hours.

Similar level of agreement has been shown for the standard MOE solution.



Conclusions

This test demonstrates that a DORIS-only MOE-like processing scheme is sufficiently robust to achieve the typical IGDR orbit radial accuracy in a near-real time scenario.

Depending on user needs, specific tuning could improve the stability of the performance over the last two hours of the batch.