



Jason-Continuity of Service

Summary of
Science Requirements for the Jason-CS orbit

Different orbit for Jason-CS?

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Agencies Request:

A clear scientific recommendation:

On acceptance of a change of orbit to meet the definition of a reference climate mission

and a ranking of preference for the proposed orbits.

Or the justification for keeping the Jason orbit



Splinter Session Discussion Summaries (1)

- POD – Feasible to move to new orbit
 - But would have impact on J-3/J-CS intercalibration
 - Recommend to make GPS mission-critical instrument
- Tides – Weak recommendation to move
 - Different spatial coverage
 - Change the aliasing frequency
- NRT – Weak recommendation to stay in Reference Orbit
 - No showstoppers for operational oceanography & wind/wave
- Cal/Val – Strong recommendation to stay on reference orbit
 - Formation Flight collinear calibration
 - Historic record of in situ sites



Splinter Session Discussion Summaries (2)

- MSS/Geoid – Split decision
 - Long record decadal variations – stay in current orbit
 - New ground tracks improve MSS (but new missions too...)
- Basin/Global Science – Strong recommendation to stay
 - Continuity important for long term variations at all scales
- Combined CLS & Hamburg studies considered sampling issues (not cal/val)
 - Considered mean sea level, tides, mesoscale & climate
 - Found no showstoppers for moving from reference orbit
 - Small impact on regional sea level from orbit change
 - Apart from slight advantage from higher inclination, no compelling orbit choice



OSTST Comments – Scientific Benefits of orbit change

- High-inclination reference mission reduces errors at high latitudes
- Change tidal aliasing away from 60 days
- Improved spatial sampling of tides
- **Above likely to be improved by SWOT**
- Improved spatial sampling for MSS
- **Above likely to be improved by other future missions**
- Possibility for new science discoveries



OSTST Comments – Concerns for orbit change

- Longer CalVal required (possibly more than 2 yrs)
- Timing of Jason-3 / Jason-CS overlap may be inadequate
- New orbit would be viewed as start of new CDR



OSTST Comments – Justifications to maintain orbit

- Reference Mission Orbit critical to global climate science
- GCOS principles for climate monitoring demand continuity & consistency
- No compelling scientific reason to change orbit
- Continues the historic, 20-yr long, sea surface height climate record
- Even mesoscale features require long time series
- Advantage of formation flight cal/val would be lost if we move
- Mid-inclination orbit gives better crossovers for currents & cal/val
- Decadal variations also require continuity



Technical Constraints - Richard Francis / ESA

- Radiation
 - Mission Performance
 - Debris
 - Deorbiting
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- Technical Solutions for these constraints exist for 1336 km orbit
 - However, the 1336 km orbit comes at higher cost (programmatic, not scientific, consideration \$-)



OSTST Recommendation for Jason-CS Orbit

Given the importance of maintaining the precise climate record of sea surface height, the challenges of calibrating & validating without formation flight between Jason-3 & Jason-CS, and the modest scientific benefits from a change of orbit: the OSTST recommends that Jason-CS maintain the 1336 km reference orbit flown by Topex/Poseidon and Jason-1, 2, & 3.