ILRS contributions to near-realtime EOP series

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GODDARD SPACE FLIGHT CENTER

UMBC

Overview

- The ILRS Analysis Working Group
  - Standard products delivered to IERS
- Near-realtime product(s):
  - EOP (x_p, y_p, and LOD)
  - Other items can be delivered if desirable (SSC)
- Benefits
  - Those with need for up-to-date EOP and those who do EOP predictions and require precise observations very close to the prediction date

ILRS' AWG

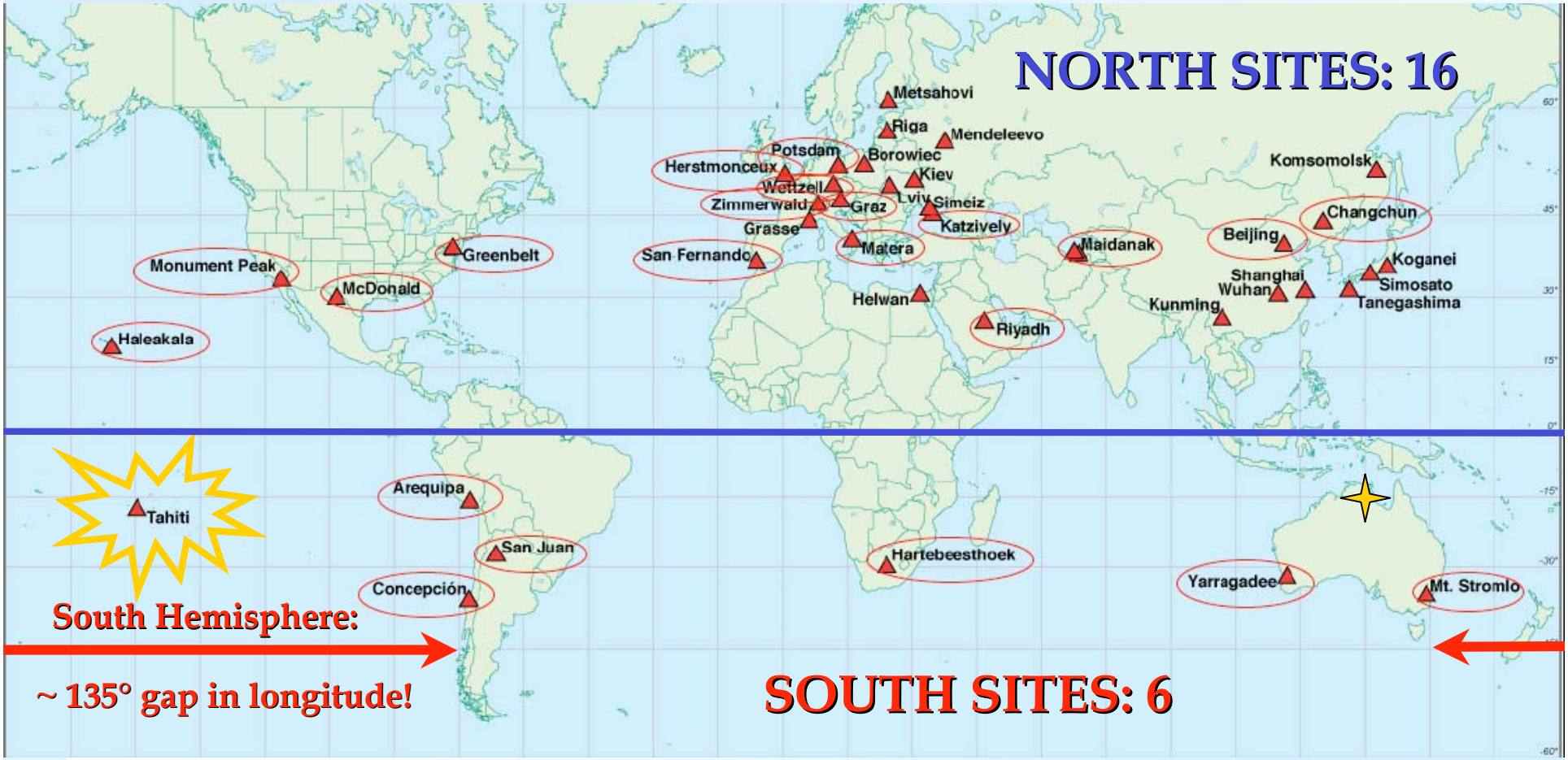
- The ILRS AWG currently consists of seven ACs:
  - ASI, BKG, DGFI, GA, GFZ, JCET and NSGF
  - GRGS/OCA expected to become the 8th AC next week
  - Two Combination Centers (CCs): ASI & DGFI
- The WEEKLY derived products are:
  - Positions and velocities for all the tracking sites (~25)
  - Daily resolution EOP (x_p and y_p, and LOD)
- These products were contributed to the ITRF2005 development project for the period 1993-2005 (incl.)

Daily Product(s)

- The ILRS AWG is currently examining the possibility to deliver to IERS a DAILY product, initially for EOP only
  - Pilot project (PP) is in progress
  - Evaluating the quality and reliability of this product
  - Investigating the desire for additional products (SSC?)

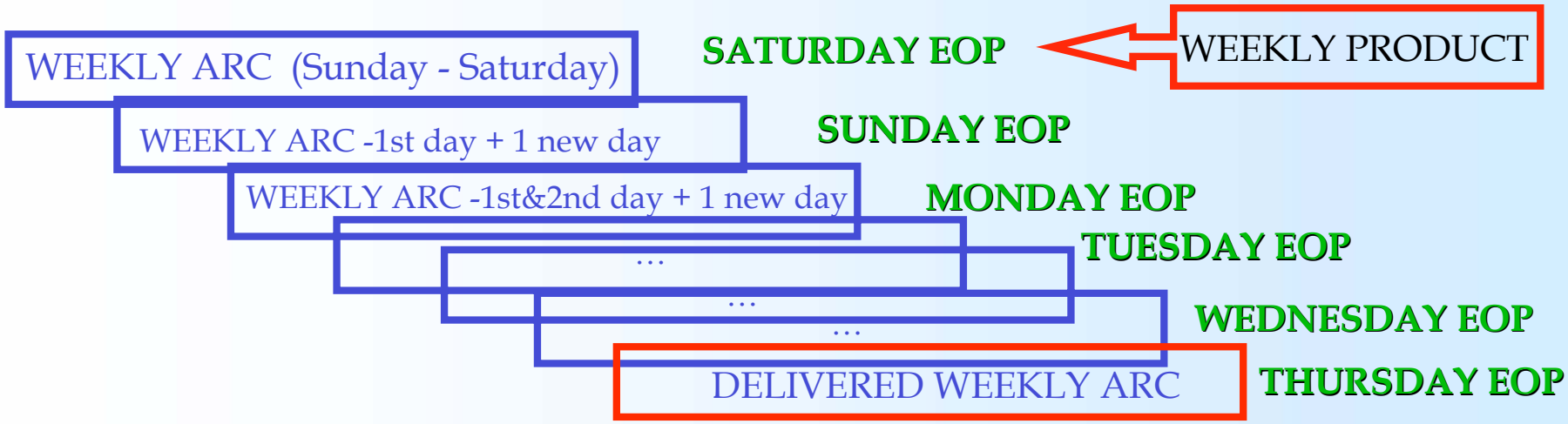
- The PP commenced recently and will likely run until the product is accepted, at which time it will become part of the operational routine of the ACs & CCs

The ILRS Network



Daily Product(s)

- The operational scheme for the daily products is:



- The PP is running at JCET since June

Daily Product(s)

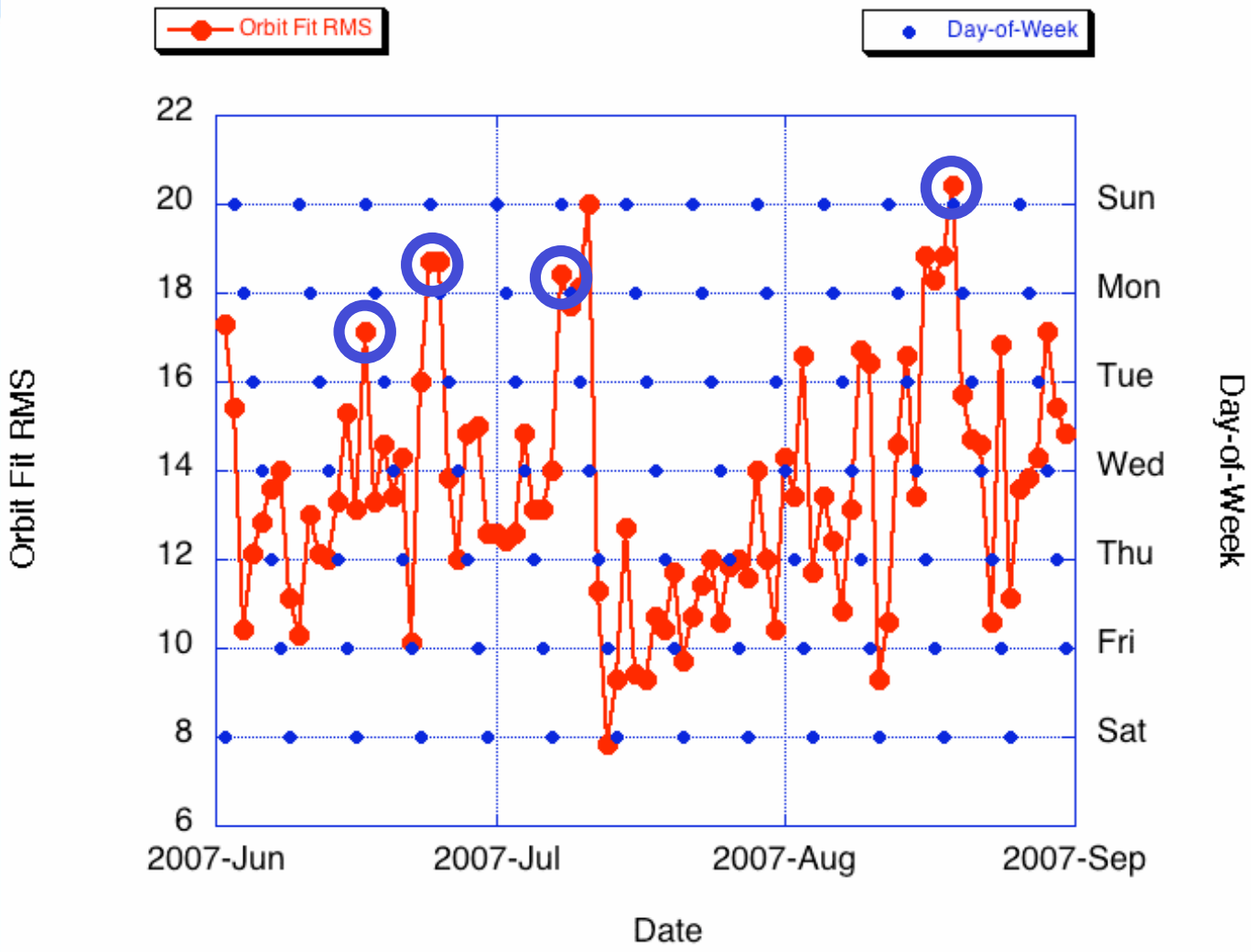
- Due to the peculiarities of the SLR data delivery schedule and the complications due to the sparseness of the network (poor geometry at present), there are issues to be decided upon

- Some of the issues are being checked now and will be decided with input from the user community (and primarily NEOS):
  - The day to be *reported* (last day of the arc, next to last, etc.)
  - We need to gauge the trade-off between having a "fresher" set of EOP vs. a more accurate one, etc.

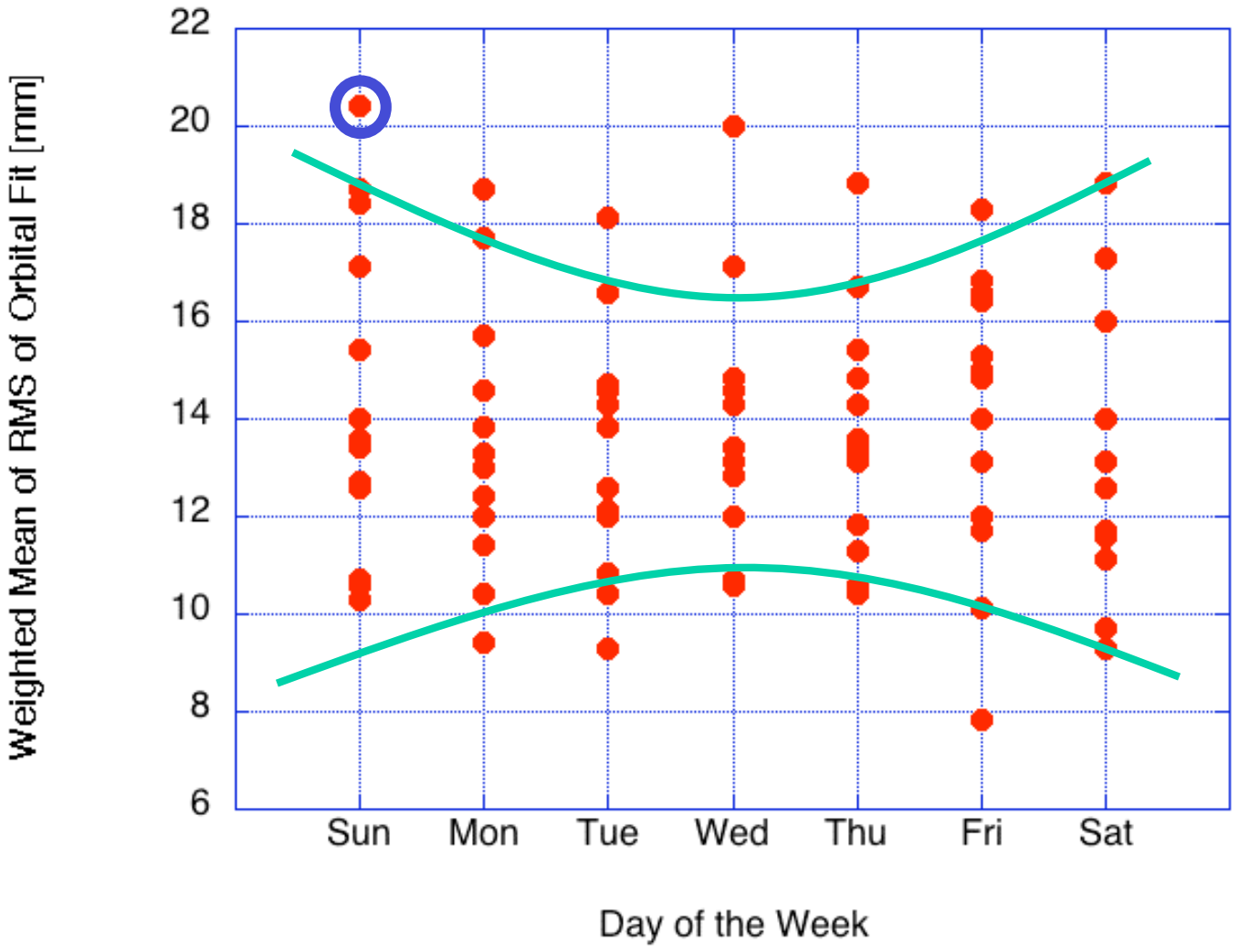
Daily EOP Test Statistics

- JCET AC is running the DAILY production test since June
- We tried to quantify the quality and stability of the product and its dependence on the available data by examination of the multiple estimates for each day (7) during each cycle of the process
- We have computed statistics for:
  - Orbital fits for different "7-day" arcs
  - The mean of the seven estimates and its std. deviation
  - The day being reported (last day of the arc, next to last, etc.)

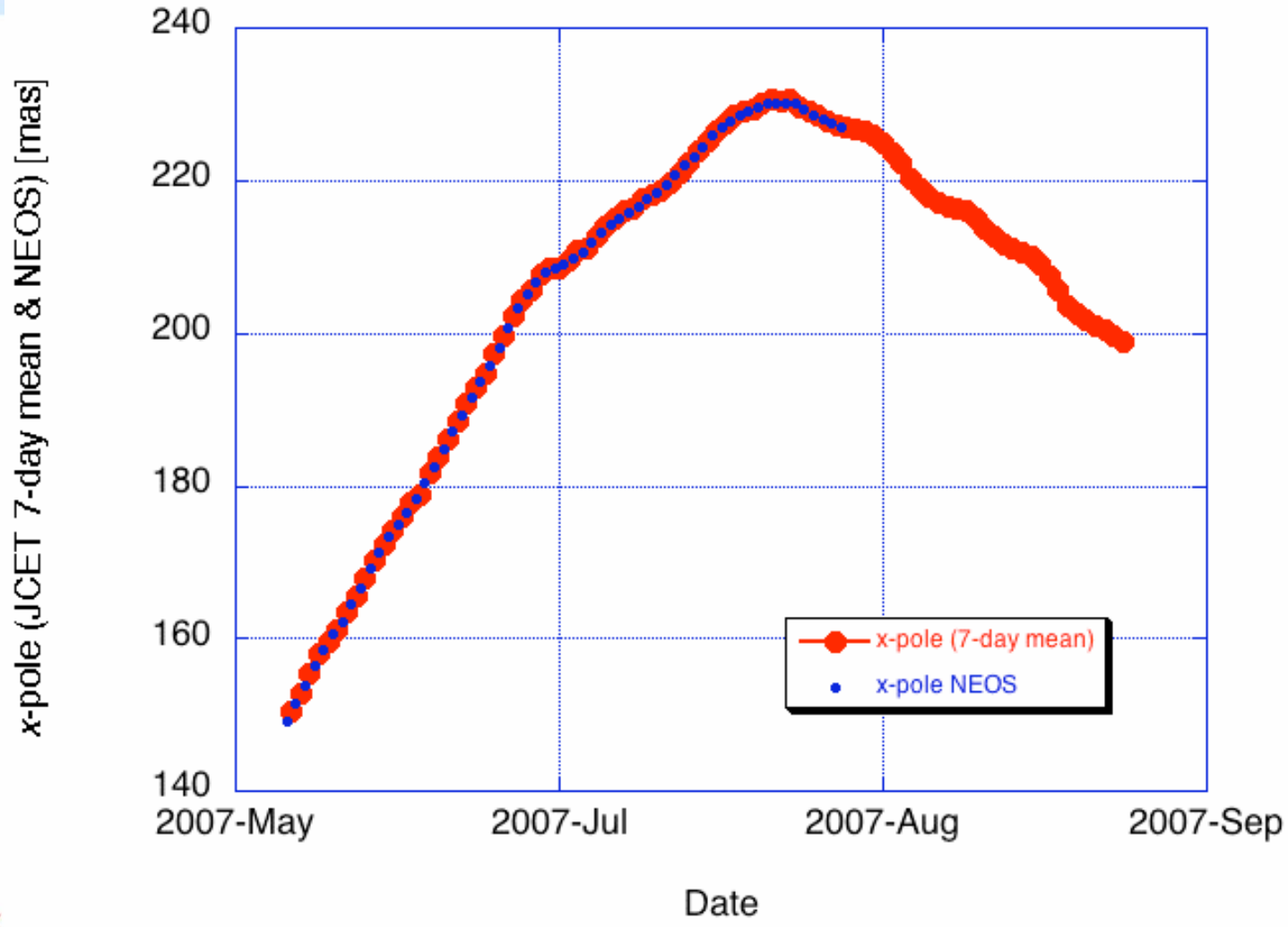
Orbital Arc Fit vs. DOW



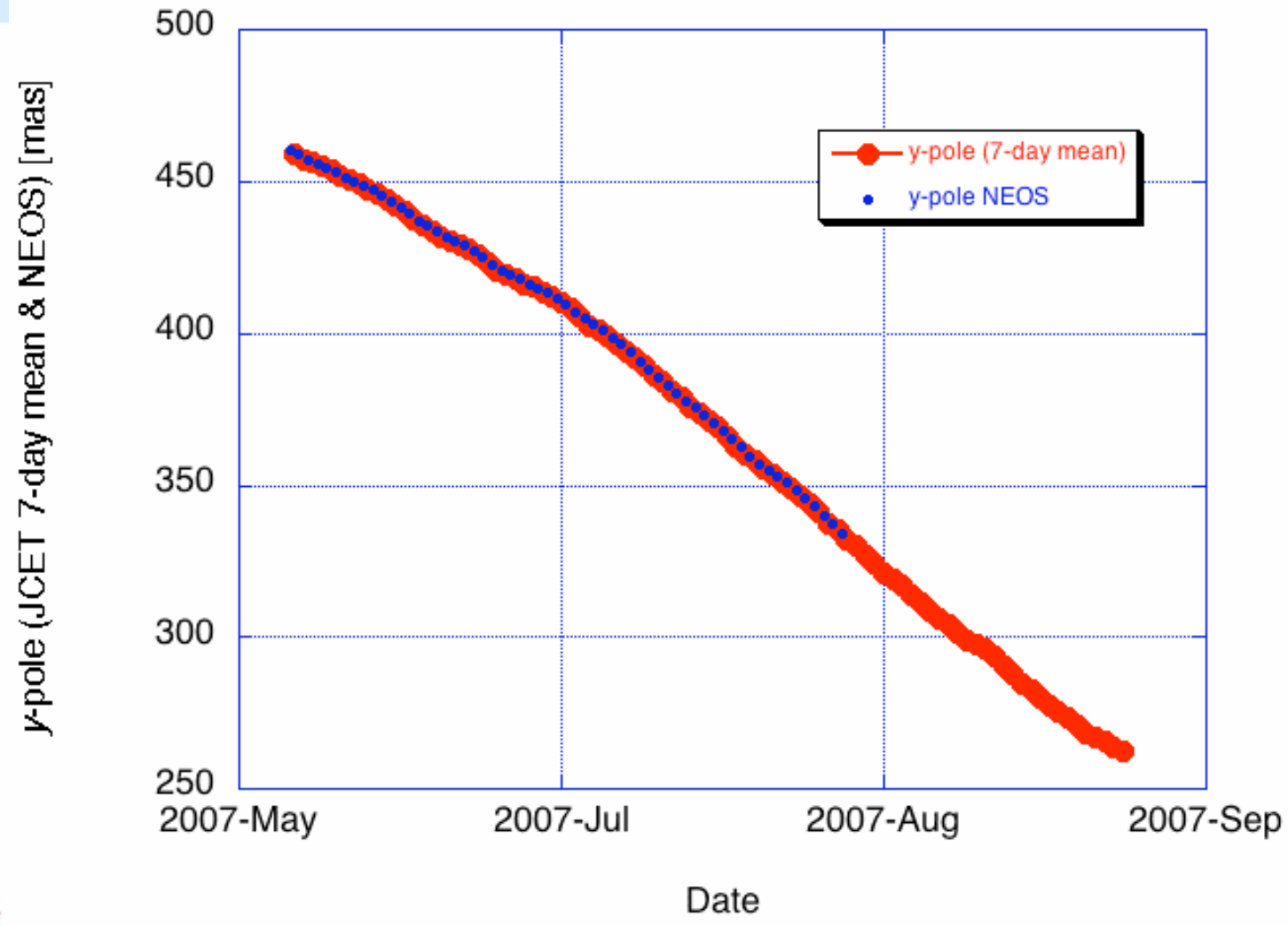
Orbital Arc Fit vs. DOW



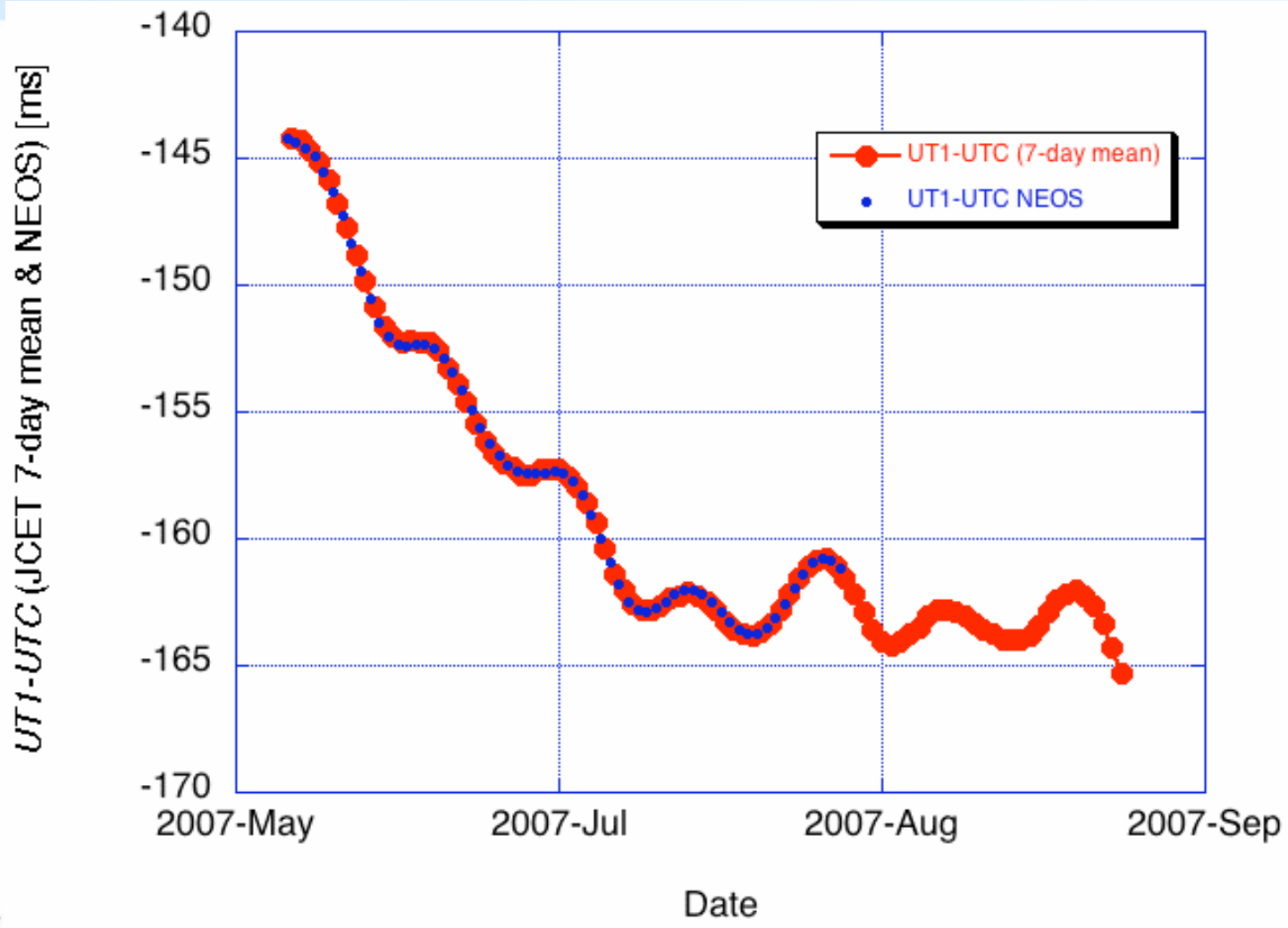
SLR Daily x_p *vs.* NEOS Finals



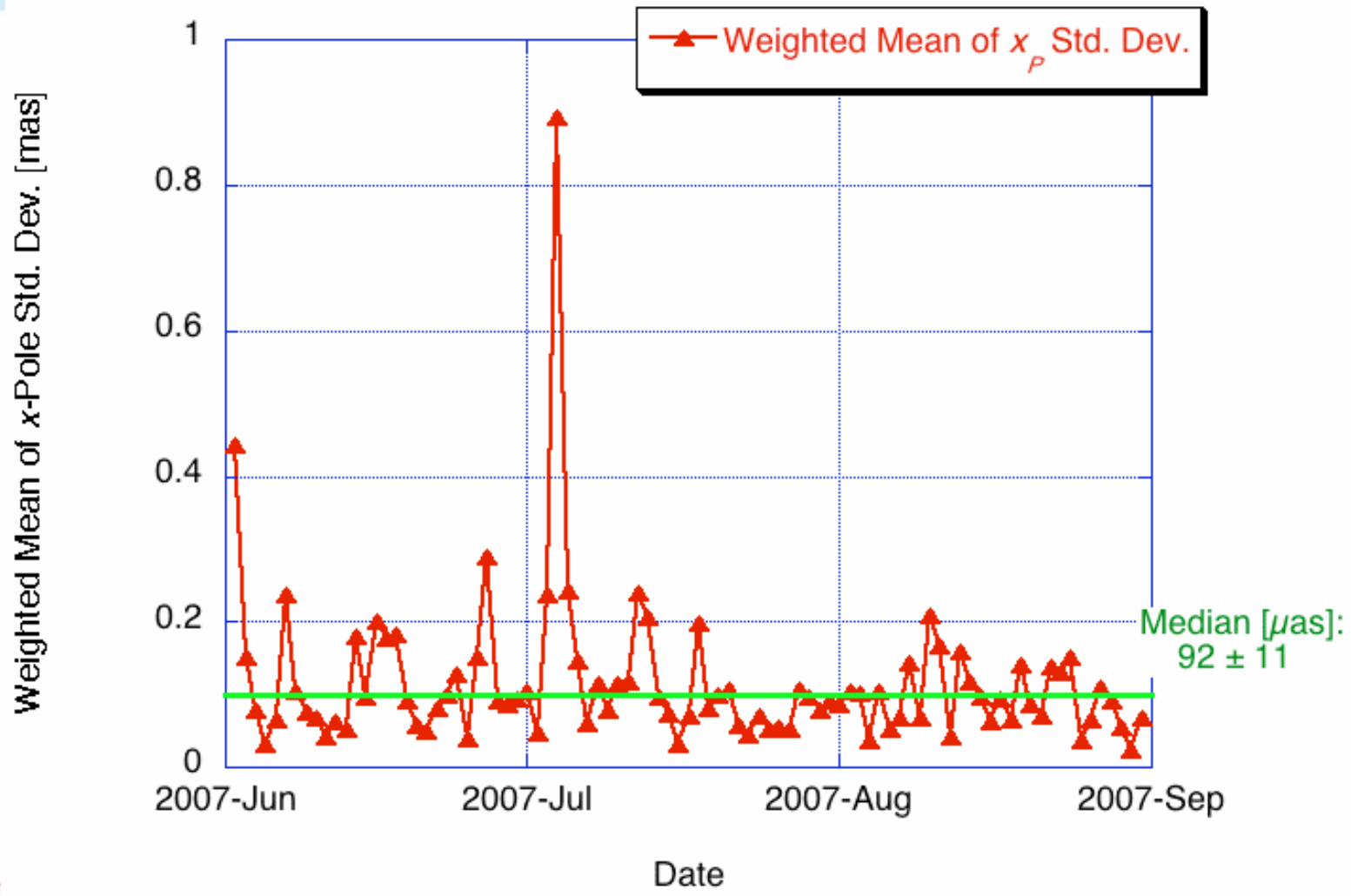
SLR Daily y_p *vs.* NEOS Finals



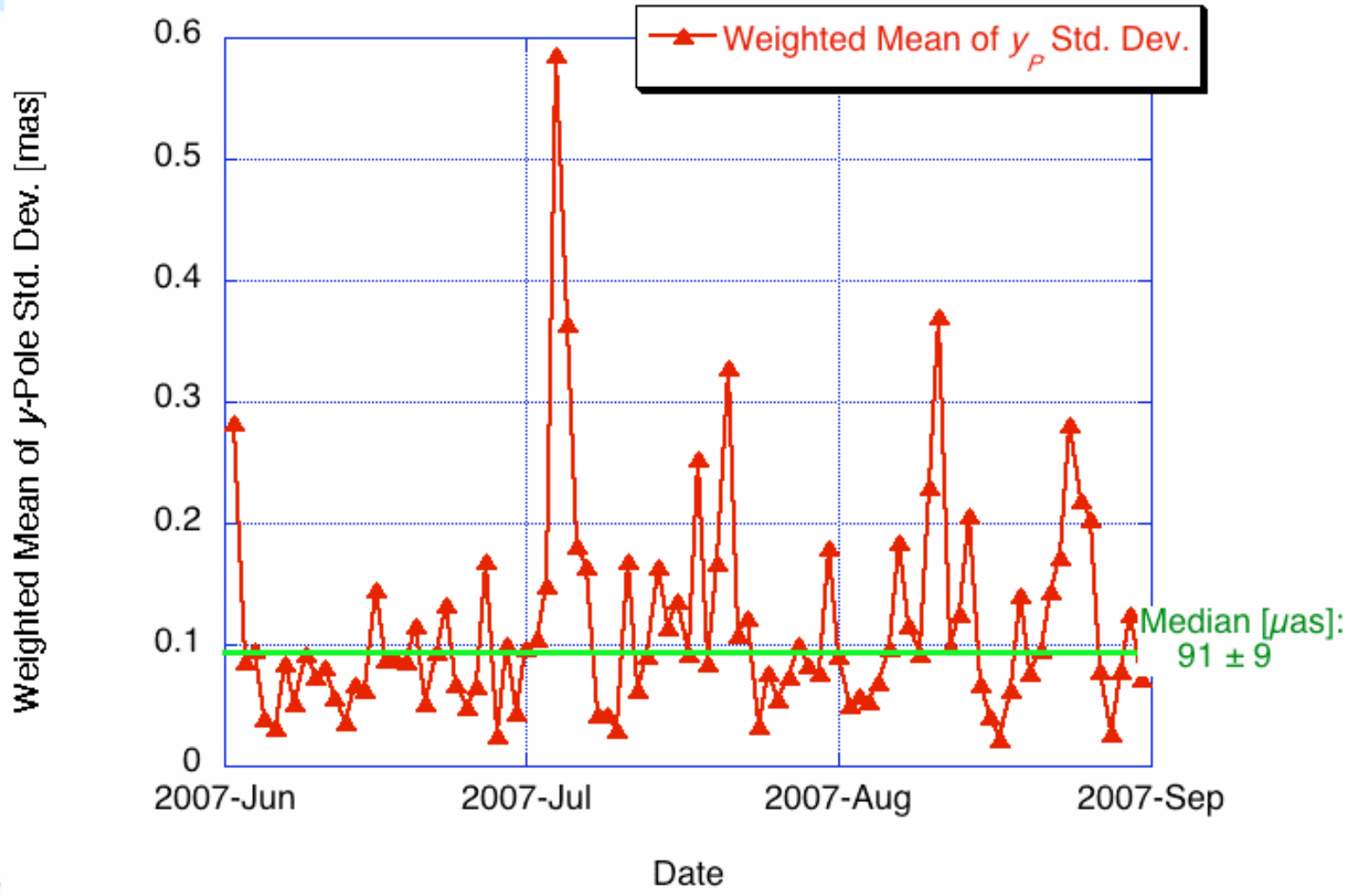
SLR Daily *UT1-UTC vs.* NEOS Finals



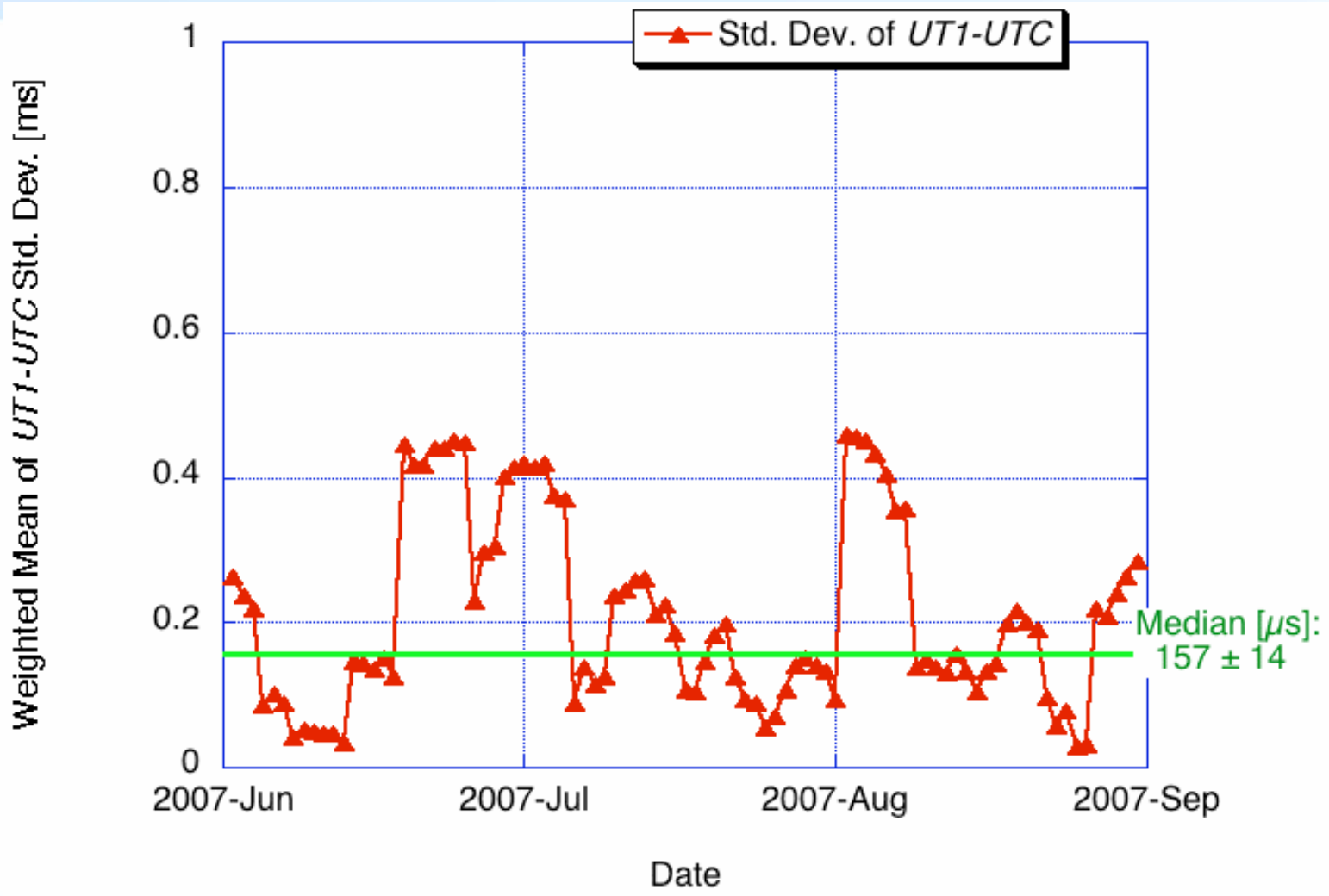
SLR Daily EOP σ_{xp} *for 7-day arc*



SLR Daily EOP σ_{yp} *for 7-day arc*



SLR Daily EOP σ_{UT1} *for 7-day arc*



Summary

- New ILRS product proposed
  - DAILY EOP SINEX (with respect to adopted ITRF)
- Initially only EOP to be reported
  - We can extend this to full SINEX (Site positions included)
- The test results from a 3-month test at JCET show consistency with WEEKLY products
  - Estimated Std. Dev. of EOP at ~ 90 μas and ~160 μs
  - As more ACs deliver their products, the combined product will likely improve by a factor of 2
- We expect that all ACs will participate by the end of 2007
- Our future plans include the investigation of adding more (low) satellites in our analysis to improve the geometry of the problem (EOP estimates are very sensitive to the coverage of all longitudes with SLR observations)
- ILRS will soon move to ITRF2005SLR and the new IERS C series