Combination Procedure of the IERS RS/PC

Brian Luzum

Outline

- Input data
- Systematic corrections
- Combination procedure

Input Data Sets

- VLBI
  - IVS
  - GSFC
  - USNO
  - GSI
  - IAA
- SLR
  - ILRS
  - IAA
  - MCC
- GPS
  - IGS Finals
  - IGS Rapid
  - IGS Ultras
  - USNO UTGPS
- AAM
  - NCEP
  - NOGAPS (NAVGEM soon)

08 C04 System

- Create residuals with respect to 08 C04
  - 08 C04 defines the IERS EOP system
- Fit robust linear estimator to residuals
  - Do not use least-squares because data are not Gaussian and outliers can skew results significantly
  - Typically use several years of data
    - Enough to get trend but not too much so that recent data are different from sample
    - Need to be careful of changes in system
- Check fit
  - Linear coefficients with previous coefficients
  - Plots of residuals and linear fits

How much data is used?

- 365 days worth of data except for
  - IGU PM (beyond IGR PM)
  - Integrated IGU LOD (only beyond VLBI)
  - AAM
    - 1 day analysis
    - 7.5 days forecasts

Combination Procedure

- Correct data to be consistent with the 08 C04 EOP system
- Combine using weighted cubic spline
  - Treats each coordinate independently
  - Spline nodes created every day
    - Curve apportions total error over span of data

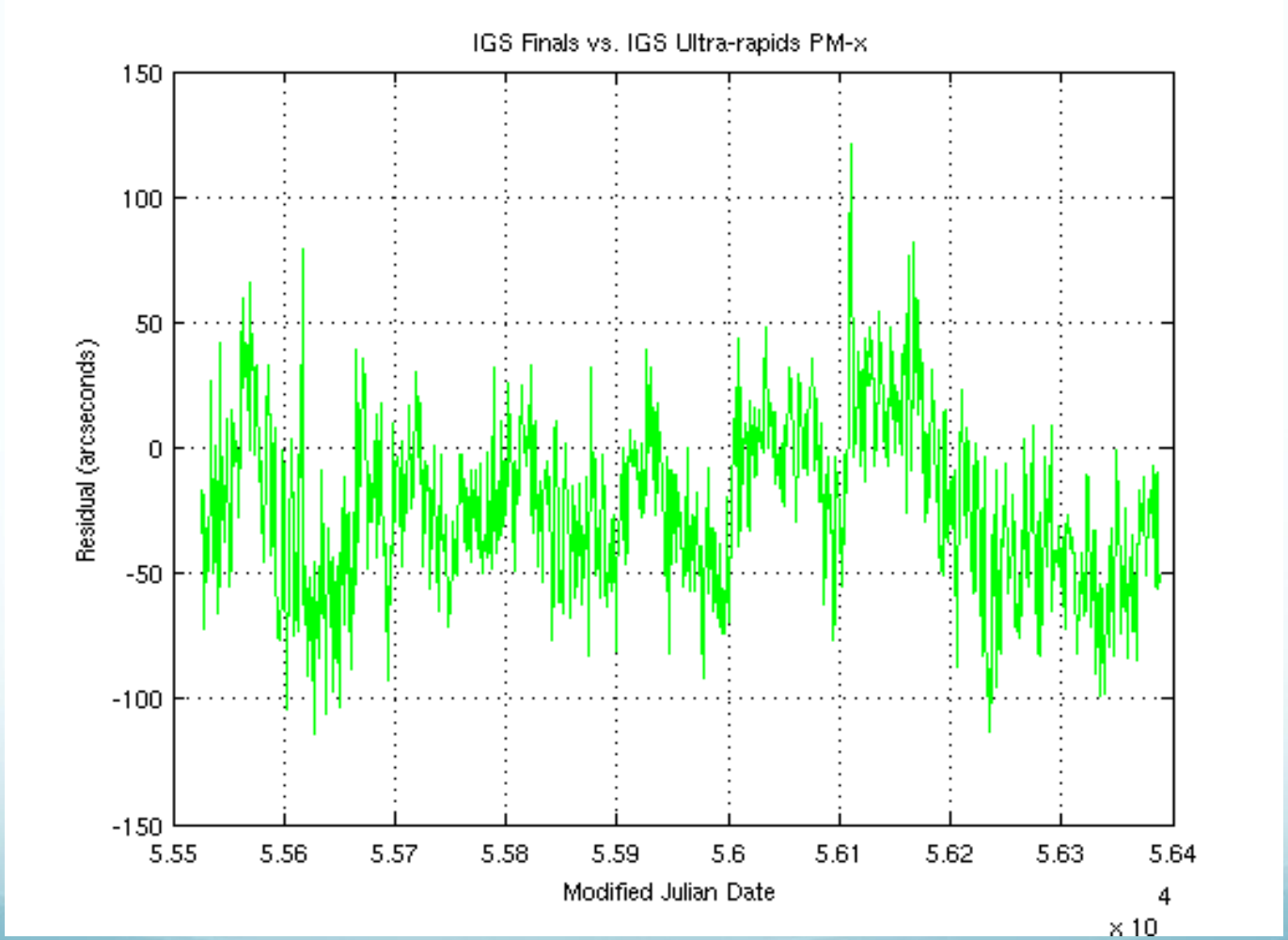
Quality and Accuracy Checks

- Problem plots
- Residual plots
- Difference plots
- Statistics
  - Residuals between solution and input series
  - Residuals between solution and external solutions

Are the frequency and latency of EOPs adequate?

- More information in Session 1 presentation
- Increased frequency and reduced latency of EOPs would improve RS/PC combination and prediction solutions

Concerns about IGS



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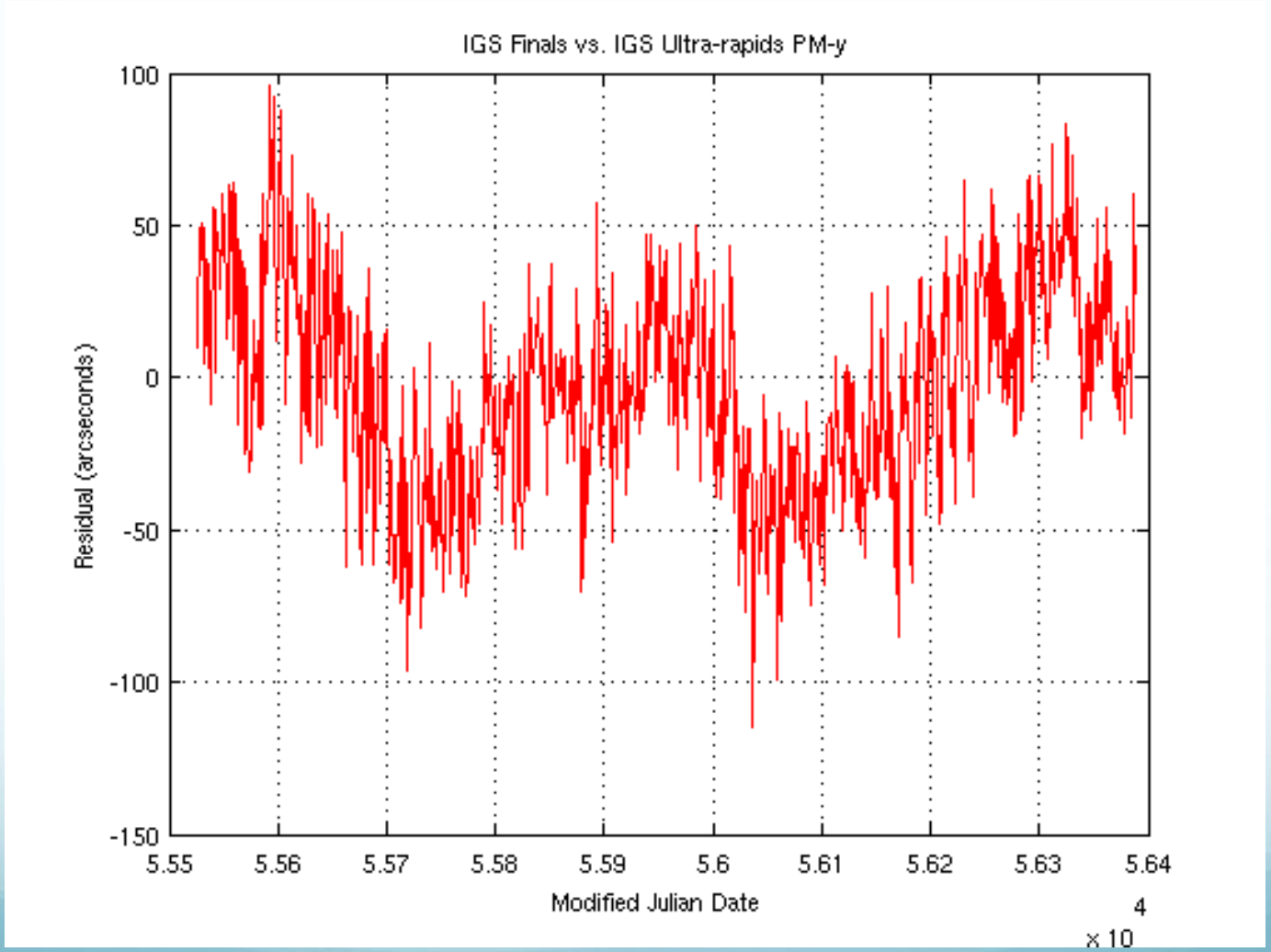

Backup

Systematic Errors

- Linear errors corrected before combination
- Other systematic errors checked manually
- Look for ‘unusual behavior’
  - Sudden changes in bias
  - Sudden changes in scatter
  - Periodic residuals
- Reported to Analysis Center
- Plans to implement automated systematic error detection