



Natural Resources
Canada

Ressources naturelles
Canada



GIPSY/OASIS

Lessons Learned from Reprocessing Campaign

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Processing Strategy Similarities

| | JPL and NRCan |
|--------------------------------|--|
| Software | GIPSY Version 5.0 |
| Observations | Ionosphere-free phase and range, LC and PC |
| Number of Stations | 80 |
| Antenna Calibrations | igs05.atx (Offset and APVs) |
| A Priori Dry Troposphere Model | GPT |
| Troposphere Mapping Function | GMF |
| Solid Earth Tide | IERS2003 |
| Pole Tide | IERS2003 |
| Ocean Tide Loading Model | FES2004/harddisp.f |
| Center of Mass Correction | Applied |
| Yaw Rates | Nominal+Estimated |



Processing Strategy Differences



| | JPL | NRCan |
|--------------------------------|-----------------------|--------------------------|
| Orbit Arc Length (hours) | 30 | 24 |
| Elevation Angle Cutoff (deg) | 7 | 10 |
| Second Order Ionosphere | Applied | Not Applied |
| Earth Orientation | IERS2003, Bulletin A | IERS96, Bulletin B |
| Static Gravity Field | GGM02C (12x12) | JGM3 (12x12) |
| Ocean Tide Gravity Field | FES2004 (convolution) | CSR3.0 |
| Solar Radiation Pressure Model | GSPM-04 (JPL) | IIA – GSPM-98, IIR-Table |
| Albedo Model | Applied | Not applied |
| Satellite Z-Offset | Not Estimated | Estimated |



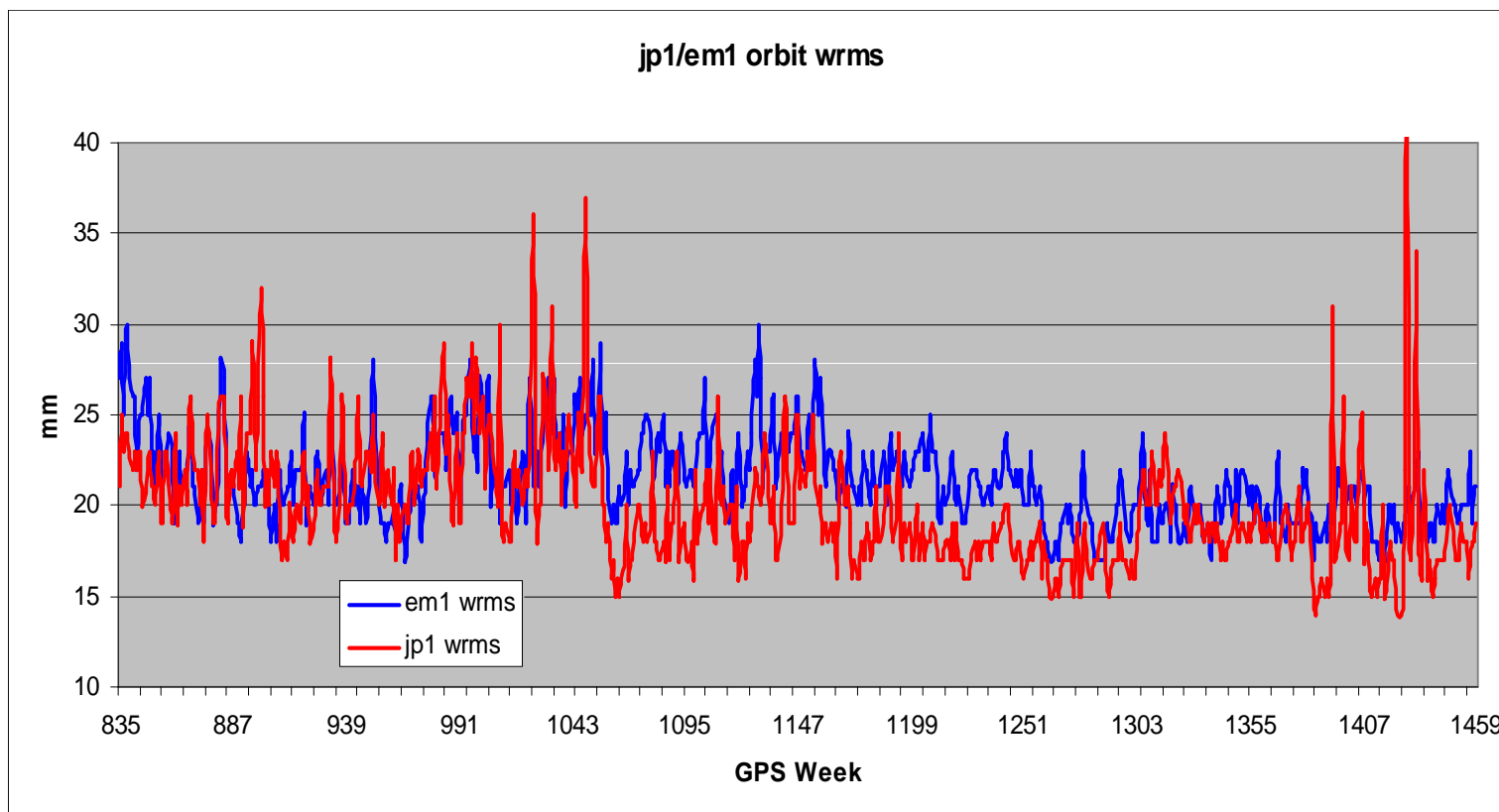
Lessons Learned: NRCan

- EM1:
 - Increased level of automation was required.
 - 1 month of daily solutions processed per day and only 1 employee to monitor problems/quality.
 - Some problems in solutions missed.
 - Independent daily solutions were required due to processing requirements (backwards in time and 20-30 concurrent daily solutions).
 - EMR solution uses day n orbits/ERP's to initialize day n+1
 - EM1 solution uses IGS orbits and Bulletin B. ERP's.
 - Early years required strategy upgrades.
 - Relaxed engineering checks required to maintain network coverage for older data (1995-1996)

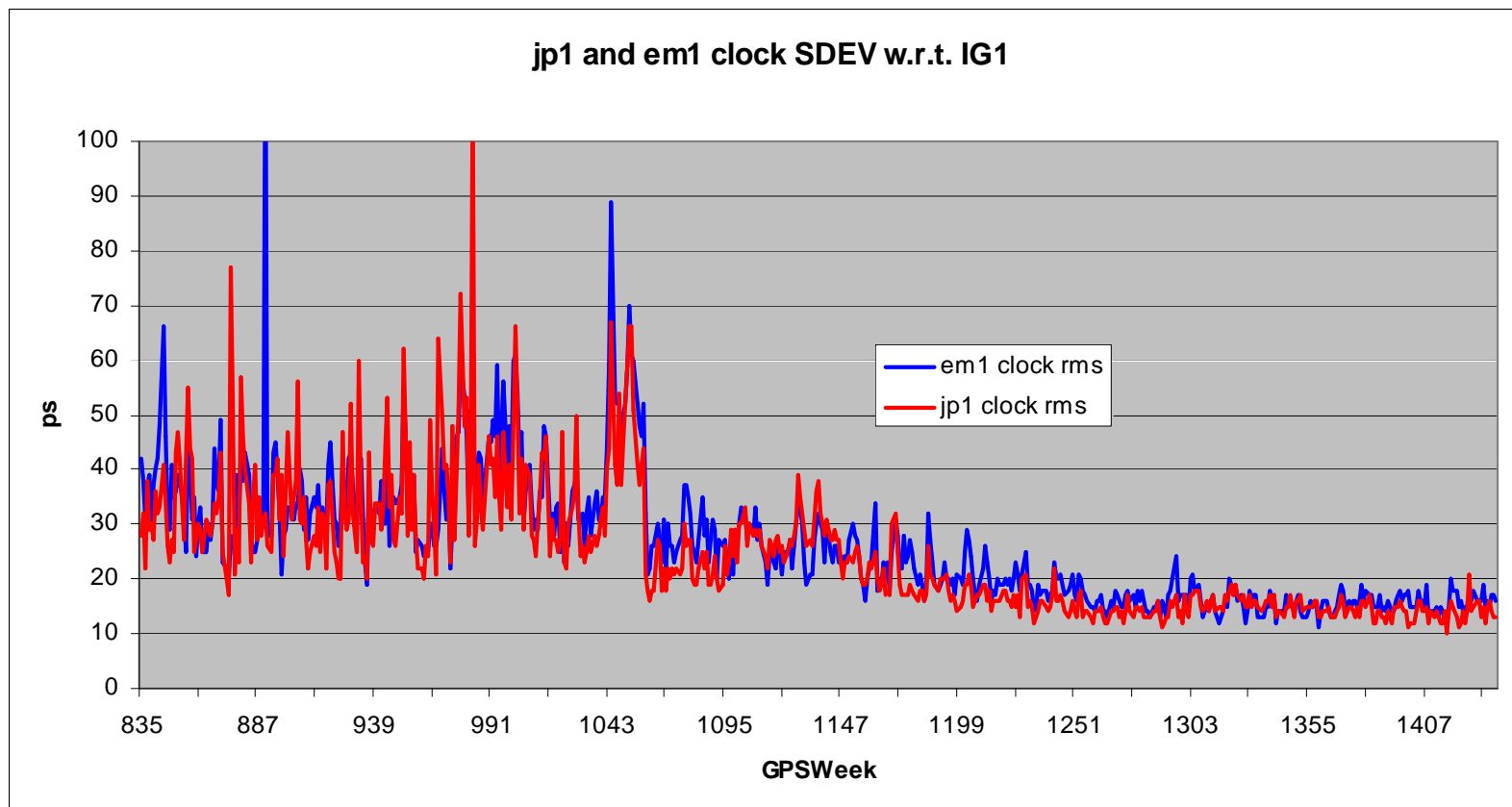


Lessons Learned: JPL

- JP1:
 - Reevaluate data quality engineering checks in early 1994-1996.
 - Investigate trade space of network coverage versus data quality.
 - Verify data archive is complete from all available sources.
 - Improve record keeping of problem days and resolution.
 - Improve reference clock selection algorithm (before 2004).
 - Balance automation with quality control.



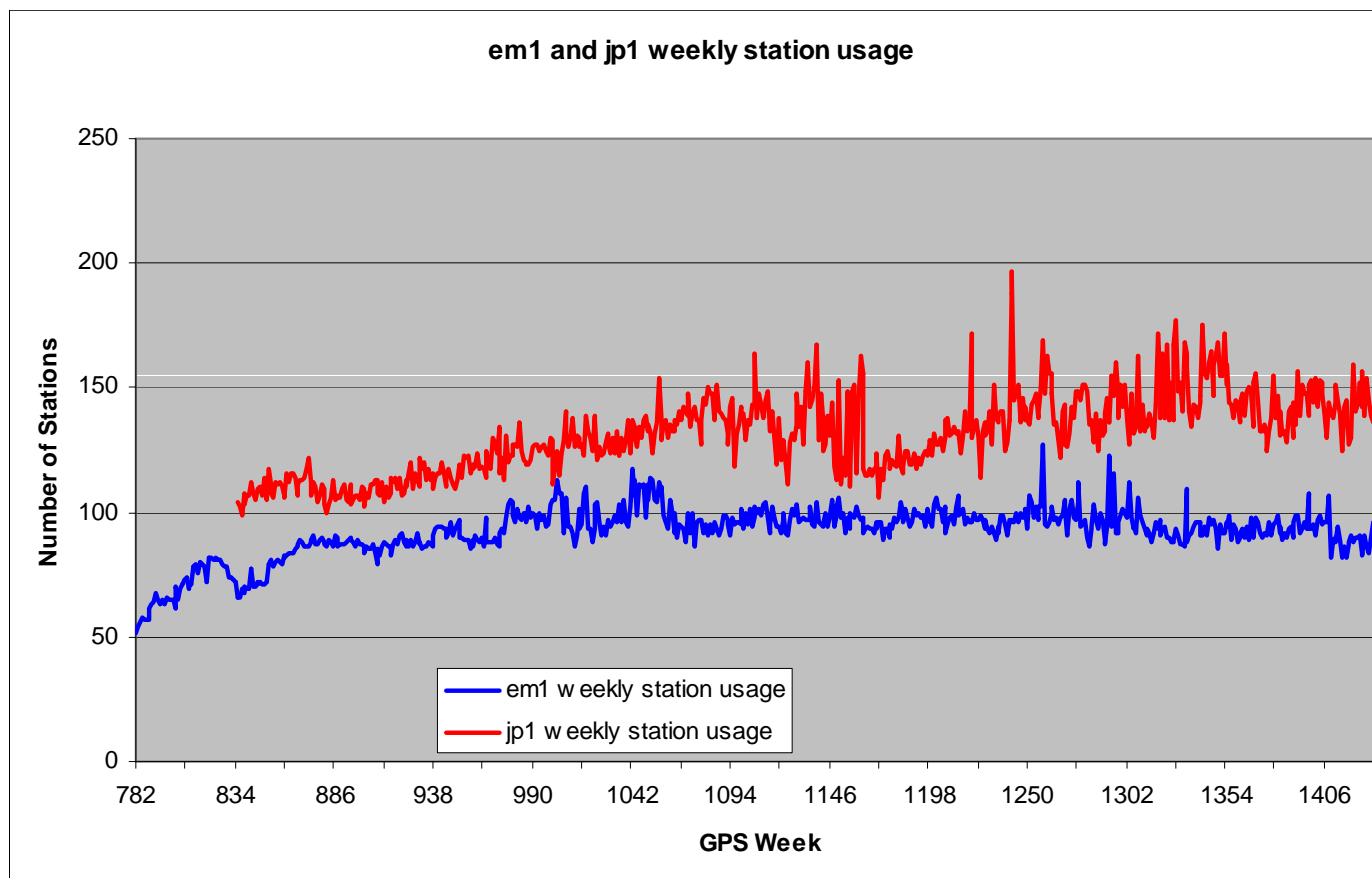
- Median 3-D RMS:
 - JP1: 19 mm
 - EM1: 21 mm



- Median 1-D RMS:
 - JP1: 19 ps
 - EM1: 23 ps



JPL and NRCan Station Usage



- Average weekly station usage extracted from IG1 combination