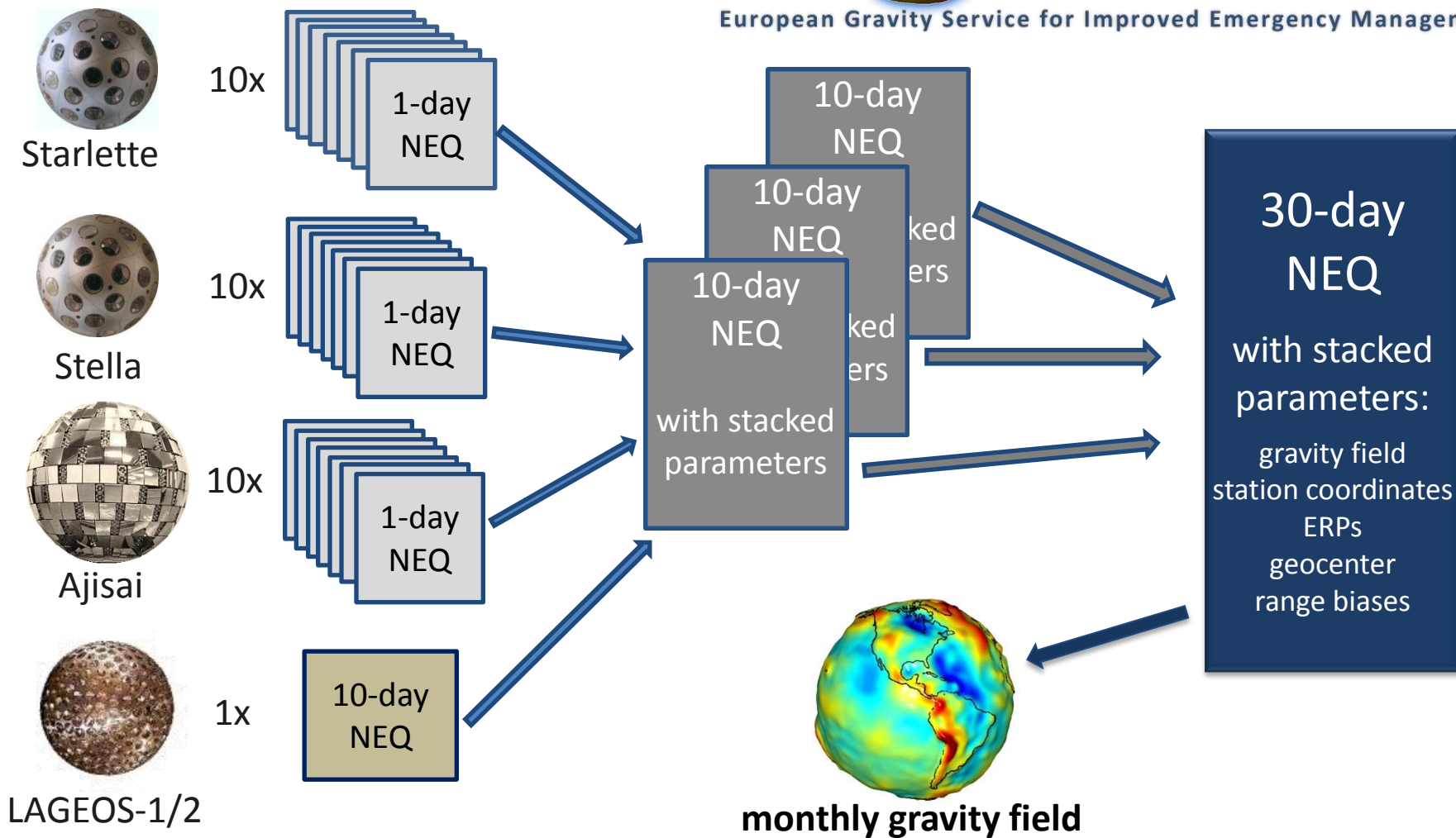


Gravity field coefficients from SLR data

Andrea Maier, AIUB (presented by Adrian)

Procedure (1)



Procedure (2)

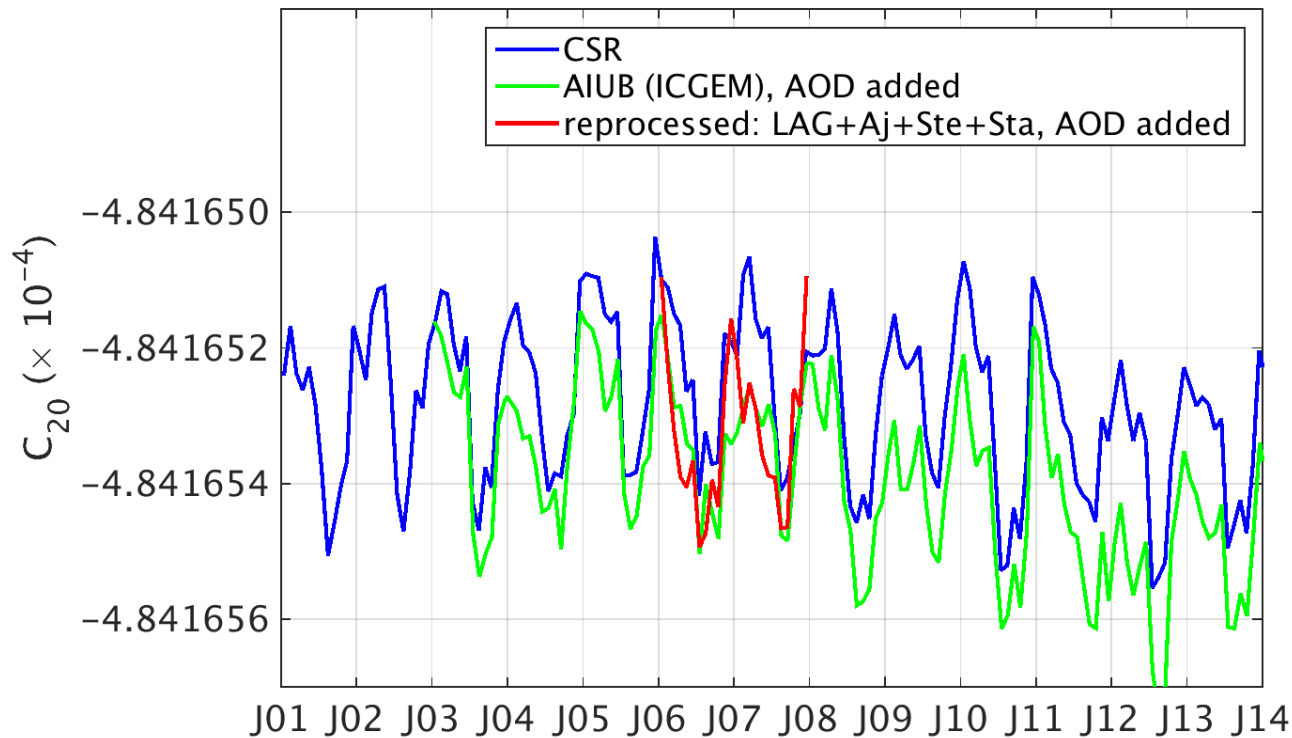
| | |
|--------------------------------------|--|
| Reference frame | SLRF2008 |
| A priori gravity field model | AIUB-GRACE03 (up to d/o 30 for LAGEOS, up to d/o 90 for LEOs) |
| Ocean tide model | EOT11a (up to d/o 30) |
| AOD applied at observation level | RL05 |
| Atmospheric drag model (LEOs) | NRLMSISE-00 |
| Albedo | monthly reflectivity coefficients in a 2.5 x 2.5 degree grid (CERES mission) |
| ... | ... |
| Weighting of satellite-specific NEQs | LAGEOS: 8mm Ajisai: 25mm Starlette/Stella: 20mm |

Procedure (3)

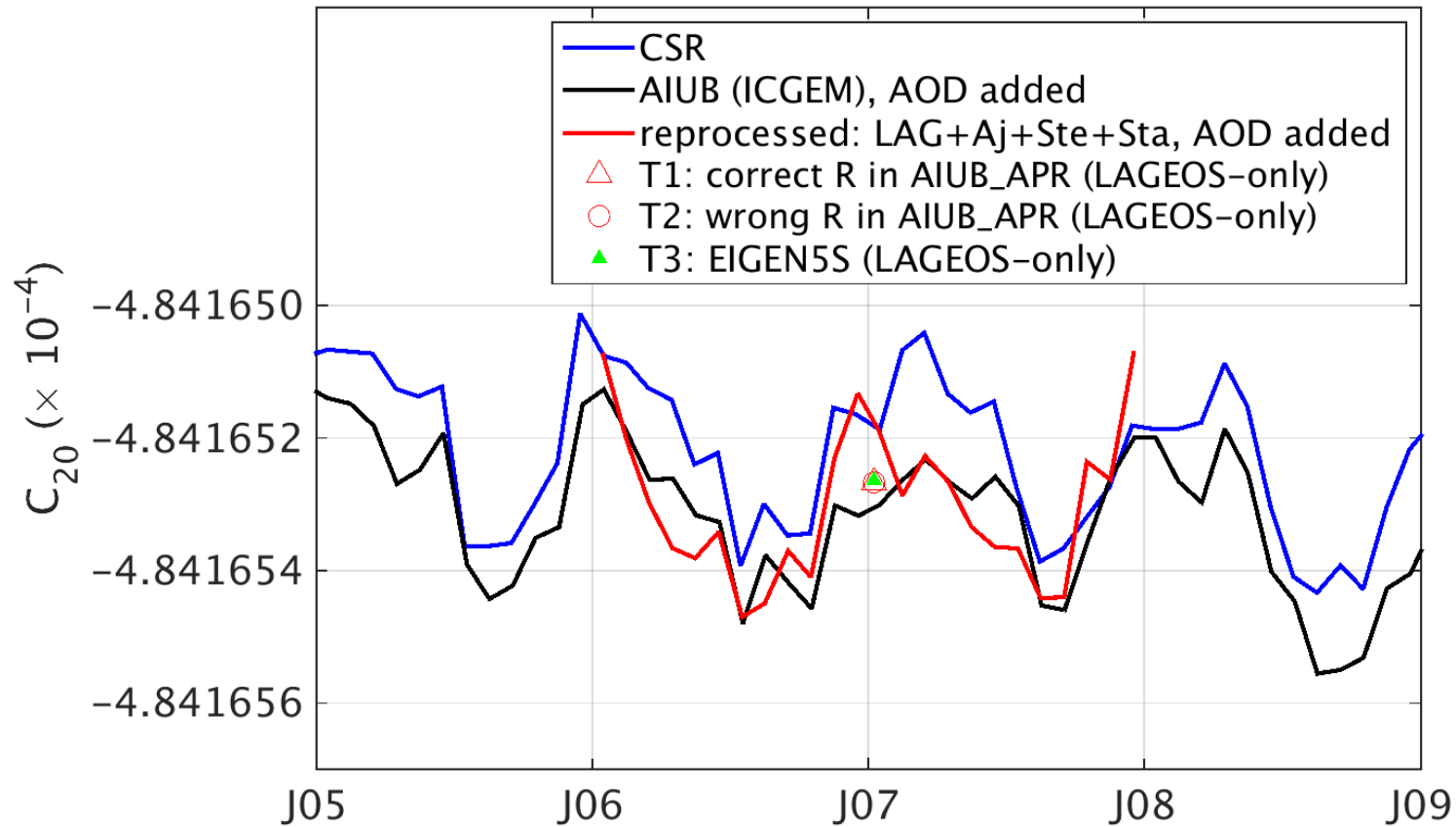
| | | |
|---------------------------|--------------------------|---|
| Estimated parameters | | SLR solutions |
| | | LAGEOS-1/2, Starlette, Stella, Ajisai (LEOs) |
| Orbits | Osculating elements | $a, e, i, \Omega, \omega, u_0$ (LAGEOS: 1 set per 10 days, LEOs: 1 set per day) |
| | Dynamical parameters | LAGEOS: const. and 1/rev along track (1 set per 10 days) LEOs: const. and 1/rev along track, 1/rev cross track (daily) |
| | Pseudo-stochastic pulses | LAGEOS: none LEOs: 1/rev in along track |
| Earth rotation parameters | | $X_p, Y_p, UT1-UTC$ (piecewise linear, 1 set per day) |
| Geocenter coordinates | | 1 set per 30 days |
| Earth gravity field | | up to d/o 6 (1 set per 30 days) |
| Station coordinates | | 1 set per 30 days |
| Range biases | | LAGEOS: for selected stations (1 set per 30 days) LEOs: for all stations (1 set per 30 days) |

Results

- AIUB C20 series is biased w.r.t. the CSR solution
 - difference between 01/01/2003 and 01/01/2012: $\sim 1.03 \times 10^{-10}$
 - reprocessing is going on right now



Tests



Next steps

- find reason for bias
- extend time series to match the mission lifetime of GRACE
- include more satellites

Available satellites:



| Satellite/Year | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 |
|----------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Ajisai | | | | | | | | | | | | | | |
| Beacon-C | | | | | | | | | | | | | | |
| Blits | | | | | | | | | | | | | | |
| Etalon-1 | | | | | | | | | | | | | | |
| Etalon-2 | | | | | | | | | | | | | | |
| LAGEOS-1 | | | | | | | | | | | | | | |
| LAGEOS-2 | | | | | | | | | | | | | | |
| Lares | | | | | | | | | | | | | | |
| Larets | | | | | | | | | | | | | | |
| Starlette | | | | | | | | | | | | | | |
| Stella | | | | | | | | | | | | | | |