

Title: NASA GSFC SLR C20 and C30 solutions

Version: 3 (see Notes)

Date created: 13 Nov 2025

Data span: 4 Apr 2002 - 1 Sep 2025 (beginning of solution)

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Description:

This file contains SLR-derived C20 and C30 values for replacing GRACE/GRACE-FO GSM

Values prior to MJD 53039 use 5 satellites: LAGEOS-1/2, Stella, Starlette, AJISAI

Values beginning on MJD 53039 use 6 satellites: Larets added

Values beginning on MJD 55987 use 7 satellites: LARES added

Values beginning on MJD 59792 use 8 satellites: LARES-2 added

C30 values are not provided prior to MJD 55987

Estimated gravity parameters:  $5 \times 5 + C61, S61$

Citation:

Loomis et al., 2020, Geophys. Res. Lett., <https://doi.org/10.1029/2019GL085488>

Notes:

AOD1B RL06 model applied for dealiasing

C20 is zero tide

Sigmas were calibrated with C30 differences to dual-accelerometer GRACE values

The background time variable gravity model was updated for Version 3 (beginning 8 Nov 2023)

Format: (F7.1,F10.4,E22.13,2F8.4,E22.13,2F8.4,F8.1,F10.4)

Column 1: MJD of BEGINNING of solution data span (matches JPL GSM)

Column 2: Year and fraction of year of BEGINNING of solution data span

Column 3: Replacement C20

Column 4: Replacement C20 - mean C20 ( $1.0E-10$ )

Column 5: C20 Sigma ( $1.0E-10$ )

Column 6: Replacement C30

Column 7: Replacement C30 - mean C30 ( $1.0E-10$ )



52821.0 2003.4959 -4.8416948608952E-04 -0.2877 0.1379 2003.5808	NaN	NaN	NaN 52852.0
52852.0 2003.5808 -4.8416952981452E-04 -0.7249 0.1298 2003.6658	NaN	NaN	NaN 52883.0
52883.0 2003.6658 -4.8416951191122E-04 -0.5459 0.1321 2003.7479	NaN	NaN	NaN 52913.0
52913.0 2003.7479 -4.8416949585268E-04 -0.3853 0.1413 2003.8301	NaN	NaN	NaN 52943.0
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