Title: UT/CSR SLR C20 and C30 solutions (Technical Note TN11E)

Version: 1

Date created: 18 November 2025

Data span: January 2002 - Present

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Description:

  Please use these estimates to replace the C20 values from the GSM files

   from GRACE and the C20/C30 values from GRACE-FO RL06 products only.

   These estimates are not intended to be used with the GRACE RL05 or earlier products.

  Values prior to MJD 55987 use 6 satellites: LAGEOS-1/2, Stella, Starlette, AJISAI, BEC

  Values beginning on MJD 55987 use 7 satellites: LARES added

  C30 values are provided prior to MJD 55987 but are of significantly degraded quality

  Estimated gravity parameters: 5x5+C60,C61,S61

  Based on 3 EOF Modes from GRACE-FO 53 Months

Citation:

  Cheng and Ries, 2023, J. Geophys. Res., DOI:10.1029/2022JB025459

Notes:

  AOD1B RL06 model applied for dealiasing

  C20 is zero tide

  Sigmas were calibrated by internal consistency (scatter)

  All values are normalized

  The background time variable gravity model based on GRACE and GRACE-FO

 FORMAT(F7.1,F10.4,E20.11,2F8.4,E18.9,2F8.4,F8.1,F10.4)

  Column 1: MJD of BEGINNING of solution data span

  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)

Column 8: C30 Sigma (1.0E-10)

Column 9: MJD of END of solution data span

Column 10: Year and fraction of year of END of solution data span

Constants:

Mean C20: -4.841694573200E-04

Mean C30: +9.571647583412E-07

GM: 3.986004415E+05 (km^3/s^2)

R: 6378.1363 (km)

Product:

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60980.0 2025.8323