

Solar C appendix

Sun · C · downloadable appendix

C.json v1.17 · 0 visible products · 17 quarantined entries

NOT_YET_DEFENSIBLE

No adopted Solar carbon abundance is available from this feed.

Highlighted Products

No adopted highlighted product has been selected. No adopted Solar carbon abundance is available from this feed.

Error-bar Forest Plot

No publication-eligible abundance products. Quarantined entries are documented below without plotted values.

How to read this forest. Each row is one independent product, preserving its band, holding, engine, indicator and line set. Engines and indicator families are never averaged. Solid bars show the supplied statistical uncertainty; wireframes show the supplied systematic uncertainty. The statistical basis and any incomplete error budget remain attached to the row. Grades describe the supplied line-pool provenance, not engine quality; evaluated theoretical CNO oscillator strengths are not relabelled as laboratory evidence. Quarantined, failed and unconstrained fits have no abundance mark. Experimental products remain explicitly not adopted. Literature references provide context, never tuning targets.

Solar carbon context

Carbon is traced by atomic C I, including forbidden [C I], and molecular CH, C₂ and CO indicators. Each probes different line formation and molecular-equilibrium sensitivities. Indicator families and atmospheric treatments remain separate products.

[C/O indicator strategy](#) · [Methodology](#)

Product visibility audit

Every feed entry is accounted for. Quarantined and archived entries retain their source disposition; their numeric fit outputs are available only in the labelled source download.

Withheld entries and source reasons (17)

quarantine · C · I · VIS · harps · solar_harps_molecfits_corrected · ALL · SET-AGSS21 · SYNTH · 1D-LTE
RYA-1097 gated re-run precedence: this product does NOT pass the RYA-1092 eligibility gate, so it was published into quarantine and did not supersede anything. [NOT_YET_DEFENSIBLE] C I is outside the ratified real set {Fe I, Fe II, Al}. It is a pilot measurement, not a product.

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quarantine · C · I · VIS · kpno_solar_atlas · solar_kpno_kurucz2005_corrected · ALL · SET-AGSS21 · SYNTH · 1D-LTE
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quarantine · C · I · VIS · harps · solar_harps_molecfits_corrected · ALL · MOL-CH_Gband · SYNTH · 1D-LTE
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quarantine · C · I · VIS · harps · solar_harps_molecfits_corrected · ALL · ATOM-CI_5052 · SYNTH · 1D-LTE
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quarantine · C · I · VIS · harps · solar_harps_molecfits_corrected · ALL · MOL-C2_Swan · SYNTH · 1D-LTE RYA-1097 gated re-run precedence: this product does NOT pass the RYA-1092 eligibility gate, so it was published into quarantine and did not supersede anything. [STAT_BASIS_MISMATCH] sigma_stat here is a 'curvature_sigma' (SYNTH route, band_products.py:506) while the rest of the feed publishes a 'standard_error' (error_budget.py:609). The feed carries no stat_basis field, so `A +/- sigma\_stat` renders as comparable when it is not -- this product's bar reads $\sim\sqrt{n}$ times worse than it is. [NOT_YET_DEFENSIBLE] C I is outside the ratified real set {Fe I, Fe II, Al}. It is a pilot measurement, not a product.

Download the evidence

[Download PDF — Solar C appendix](#)

[Source feed — includes quarantined fit outputs, not adopted abundances](#)

[Complete product visibility audit](#)

[Shared website/PDF report](#)

[Reproducibility manifest](#)

[Complete references and product-to-source bindings](#)

Reproducibility

Generated from the pinned CNO campaign snapshot. Source commit

a1ec12a9cc09472037e2af3b1242db2ce5b37c6b

Feed C.json v1.17 · updated 2026-09-13T04:21:45Z

Generated 2026-09-12T23:07:15-06:00 (source commit timestamp)

Feed SHA-256 a8e4c55286be31f9752d7ce58d1007faa8893382b3c224643edbf448339de9af

Generator scripts/generate_cno_publication.py v1.0.0

[Pinned scientific source](#)

References / Data & Model Sources

Sources are separated by their role. Registered grid lineage and quarantined diagnostics do not imply an adopted abundance or an applied correction.

See the source notes for the distinction between reference lineage and the treatment actually recorded in each feed entry.

Science and provenance source notes

Solar abundance and indicator analyses. Solar C atomic/molecular indicator lineage and atmospheric sensitivity; comparison literature, not an adopted Codex abundance. Sources: [1], [2].

Atomic data and gf authorities. The recorded C I/II pedigree is the partial NIST MCHF update described by Wiese & Fuhr; evaluated theory is not primary laboratory evidence. Sources: [3], [4].

Atomic data and gf authorities. AGSS21 names Li et al. for its C I gf lineage. This reference calculation is distinct from the campaign's NIST/MCHF adjudication; no gf source is substituted here. Sources: [5].

Model and grid sources. Registered C I line/grid lineage: Amarsi, Nissen & Skuladottir 2019, A&A 630, A104 — line-by-line 3D-NLTE / 1D-NLTE grids (CDS J/A+A/630/A104). The current feed treatment remains

authoritative; a grid reference does not imply a correction was applied. Sources: [6].

Atomic data and gf authorities. Atomic C I entry; source-family pedigree only, not a substitute for a per-transition gf join. Sources: [3], [4].

Model and grid sources. Feed treatment: 1D-LTE; no NLTE/3D correction is claimed for this entry. Turbospectrum is the synthesis implementation. Sources: [7].

Molecular line data and delivery. CH line-data delivery: CH A-X: Masseron et al. 2014 (MNRAS 442, 1489) / 2022 update. Masseron compilation, VALD-based, distributed with iSpec/Turbospectrum (Gerber et al. 2023, A&A 669, A43; uploaded 2022 to keeper.mpg.de, split per wavelength region) — see molecules-dir README.md The primary intake identifies Masseron 2014 as A&A 571 A47; the older delivery manifest's MNRAS locator conflicts with that record. Sources: [2], [7], [8].

Molecular line data and delivery. C2 line-data delivery: C2 Swan d³Πg-a³Πu (Brooke et al. 2013 / Masseron compilation). Masseron compilation, VALD-based, distributed with iSpec/Turbospectrum (Gerber et al. 2023, A&A 669, A43; uploaded 2022 to keeper.mpg.de, split per wavelength region) — see molecules-dir README.md Sources: [2], [7], [9].

Product-to-source index

C-quarantine-d336fe3e3260 · quarantine · VIS · solar_harps_molecfit_corrected · SET-AGSS21 · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-41dc4d995d0a · quarantine · VIS · solar_harps_molecfit_corrected · not supplied · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-d7f7f2d3feb3 · quarantine · VIS · solar_kpno_kurucz2005_corrected · SET-AGSS21 · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-639e603cf7be · quarantine · VIS · solar_kpno_kurucz2005_corrected · not supplied · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-2aa4ddfc06a1 · quarantine · VIS · solar_kpno_molecfit_corrected · SET-AGSS21 · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-9b3b9069e4e7 · quarantine · VIS · solar_kpno_molecfit_corrected · not supplied · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-3bc9c9cad7eb · quarantine · VIS · solar_iag · not supplied · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-355831cbb1ba · quarantine · red-optical · solar_iag · SET-AGSS21 · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-4fbb94c006f5 · quarantine · red-optical · solar_iag · not supplied · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-fcfcfc6a7f1 · quarantine · red-optical · solar_kpno_kurucz2005_corrected · SET-AGSS21 · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-7dc0d38da697 · quarantine · red-optical · solar_kpno_kurucz2005_corrected · not supplied · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-cfe54788e705 · quarantine · red-optical · solar_kpno_molecfit_corrected · SET-AGSS21 · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-f3b6b9c248bd · quarantine · red-optical · solar_kpno_molecfit_corrected · not supplied · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-a9c721228e27 · quarantine · VIS · solar_harps_molecfit_corrected · MOL-CH_Gband · 1D-LTE · not supplied · [1], [2], [7], [8]

C-quarantine-886af3241708 · quarantine · VIS · solar_harps_molecfit_corrected · ATOM-Cl_5052 · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-801532fb2d97 · quarantine · VIS · solar_harps_molecfit_corrected · ATOM-Cl_5380 · 1D-LTE · not supplied · [1], [3], [4], [7]

C-quarantine-1c1b6ac111e3 · quarantine · VIS · solar_harps_molecfits_corrected · MOL-C2_Swan · 1D-LTE · not supplied · [\[1\]](#), [\[2\]](#), [\[7\]](#), [\[9\]](#)

Complete applicable bibliography

Solar abundance and indicator analyses

[1] — Asplund, M.; Amarsi, A. M.; Grevesse, N. (2021). The chemical make-up of the Sun: A 2020 vision. *A&A* 653, A141 DOI: 10.1051/0004-6361/202140445. [source record](#)

[2] — Amarsi et al. 2021, *A&A* 656 A113 DOI: 10.1051/0004-6361/202141384. [source record](#)

Atomic data and gf authorities

[3] — Kramida, A.; Ralchenko, Yu.; Reader, J.; NIST ASD Team (2024). NIST Atomic Spectra Database (version 5.11/5.12). National Institute of Standards and Technology, Gaithersburg, MD DOI: 10.18434/T4W30F. [source record](#)

[4] — Wiese, W. L.; Fuhr, J. R. (2006). New Critical Compilations of Atomic Transition Probabilities for Neutral and Singly Ionized Carbon, Nitrogen, and Iron. Proceedings of the NASA Laboratory Astrophysics Workshop (14-16 February 2006, UNLV, Las Vegas) [source record](#)

[5] — Li, Amarsi, Papoulias, Ekman & Jonsson 2021, *MNRAS* 502, 3780 DOI: 10.1093/mnras/stab214. [source record](#)

Model and grid sources

[6] — Amarsi, A. M.; Nissen, P. E.; Skuladottir, A. (2019). Carbon, oxygen, and iron abundances in disk and halo stars. *A&A* 630, A104 DOI: 10.1051/0004-6361/201936265. [source record](#)

[7] — Gerber, J. M.; Magg, E.; Plez, B.; Bergemann, M.; Heiter, U.; Olander, T.; Hoppe, R. (2023). Non-LTE radiative transfer with Turbospectrum. *A&A* 669, A43 DOI: 10.1051/0004-6361/202243673. [source record](#)

Molecular line data and delivery

[8] — Masseron et al. 2014, *A&A* 571 A47 DOI: 10.1051/0004-6361/201423956. [source record](#)

[9] — Brooke et al. 2013, *JQSRT* 124, 11 DOI: 10.1016/j.jqsrt.2013.02.025. [source record](#)