Compliance sheet — star-chebyshev

Everything a supplier qualification, a legal review or an export check usually asks about star-chebyshev 0.1.0, in one document.

1. Identity

Document	STAR-PKG-STAR-CHEBYSHEV-EN · v2.3 · 2026-11-14
Package	star-chebyshev
Version	0.1.0
Capability	star.numerics.chebyshev-series
Maturity	Released & Verified (RELEASED)
Python	>=3.9
Source commit	dc09f61d
Source	https://github.com/Andrea07072000/S.T.A.R.-/tree/main/packages/star_chebyshev

2. Licence and obligations

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3. What it needs at run time

Nothing beyond the Python standard library: it works offline.

4. Integrity

SHA-256 fingerprints of the files published on this website. Check a downloaded file with:

```
python -c "import
hashlib,sys;print(hashlib.sha256(open(sys.argv[1],'rb').read()).hexdigest())" star_chebyshev-
0.1.0-py3-none-any.whl
```

FILE	SHA-256
star_chebyshev-0.1.0-py3-none-any.whl	06063d5c6fe85ce74ea38c07348b208d4b9f0155c2edaca401b5dec3e954d021
star_chebyshev.py	b44ad7ed248449ddc2181d573022dc3662b405db5b239a898fde155790f494db
star_chebyshev-0.1.0-source.zip	192e5c3621bcf5fc6ac7f5ea943ff5a32e2696279b888d769befaffe15ddc890

5. What it does, and its limits

Value and first derivative of a Chebyshev series by Clenshaw's recurrence, on [-1, 1] or on an interval given by midpoint and radius (the convention of ephemeris segments); 600 series agree with CSPICE chbval/chbder and NumPy within 1e-14 and with mpmath at 40 digits within 5e-14 of the natural scale of the sum; reproduces the NAIF documentation example.

Evaluation only: no fitting of coefficients, no reading of ephemeris files, no second or higher derivatives, no integration of the series. The error of the result is that of Clenshaw's recurrence in double precision, about 1e-15 of the sum of |c_k| (more for the derivative, by the factor k²): when the terms cancel, the relative error of a small result is larger and is not bounded here. For an ephemeris, the accuracy of a position is that of its coefficients, which this module cannot judge.

- `evaluate(coefficients, x)` returns the sum of c_k T_k(x) and its derivative for x in [-1, 1], c_0 first, by Clenshaw's recurrence (the polynomials T_k are never formed).
- `evaluate_on(coefficients, t, mid, radius)` evaluates the same series at x = (t - mid) / radius and returns the derivative with respect to t. A t outside the interval is refused; one that leaves it by rounding alone (at most two units in the last place) is taken as the end.
- Measured on 600 series of 1 to 40 terms at points of random intervals, ends included: value and derivative agree with CSPICE `chbval`/`chbder` and NumPy within 1e-14, and with mpmath at 40 digits within 5e-14, of the natural scale of the sum (sum of |c_k|; sum of k² |c_k| / radius).
- Every function returns two floats or raises `ValueError`: a malformed coefficient list (1 to 200 finite numbers within 1e100, booleans refused), x outside [-1, 1], t outside the interval, a midpoint or radius out of range.

6. Export, use and certification

The package is published and freely available. That usually takes software out of export-control lists, but not every use of it: read the page on space activities and export control before using it in a controlled programme. It is not certified or qualified for flight; the evidence describes what was tested and how.

7. Citation and bill of materials

```
@software{cavazzini_star_chebyshev_0_1_0,
  author  = {Cavazzini, Andrea},
  title   = {{star-chebyshev}: Chebyshev series with their derivative},
  version = {0.1.0},
  year    = {2026},
  url     = {https://andrea07072000.github.io/S.T.A.R.-/software/star_chebyshev/},
  note    = {Apache-2.0. Source: https://github.com/Andrea07072000/S.T.A.R.-, commit dc09f61d}
}
```

CITATION.cff · BibTeX · SBOM CycloneDX 1.5 · SBOM SPDX 2.3

8. Warranty and liability

Provided "as is", without warranties or conditions of any kind (Apache License 2.0, sections 7 and 8), to the extent the law allows. This never excludes liability that the law does not allow to exclude.

Related: space activities and export control · acceptable use · evidence and limits · licence texts