Compliance sheet — star-wrap

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

1. Identity

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

2. Licence and obligations

Apache License 2.0. You may use, copy, modify and distribute it, also commercially, and you receive a patent licence from the contributors. When you redistribute it: keep the LICENSE file and the copyright notices (and a NOTICE file, if a future version adds one), and state in modified files that you changed them. You may not use the S.T.A.R. name to endorse your product.

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_wrap-0.1.0-
py3-none-any.whl
```

FILE	SHA-256
star_wrap-0.1.0-py3-none-any.whl	fcbc3e630b7ce6d55e22436c1056a2c12e8b54c78b9127f4e66a8690749e1f30
star_wrap.py	b3719bf9bb565f0541ce464de9884f4caa718e1348f1486902b9866d7f003515
star_wrap-0.1.0-source.zip	da39eb7eb4db44e6d516d95d503e0d9d70da040a285a65ed3b2f569cd0e78f8d

5. What it does, and its limits

Reduction of angles to [0, 360) and [-180, 180), shortest signed difference and circular mean; identical to astropy, within 2.4e-10 deg of ERFA and 6e-14 deg of SciPy on 600 angles and 600 samples, every result inside its range, undefined means refused.

Half a turn is −180, not +180: callers who need (−180, 180] must map it themselves. The circular mean is not a weighted mean and gives no dispersion. An angle is a float: 1e12 deg still reduces exactly, but its own last digit is already 1e-4 deg.

- `wrap360` returns [0, 360) and `wrap180` returns [-180, 180), with the exact floating-point remainder: an angle of 1e9 deg loses nothing in the reduction. Reproduces the reductions of Meeus Example 25.a.
- `difference(a, b)` is a − b as the shortest signed rotation in [-180, 180); `circular_mean(angles)` is the direction of the mean unit vector in [0, 360), and is refused when the vectors cancel.
- Measured on 600 angles up to 1e6 deg (100 within 1e-9 deg of a multiple of 180) and 600 samples: identical to astropy, within 2.4e-10 deg of ERFA (which rounds through radians), circular means within 6e-14 deg of SciPy; every result inside its range.
- Every function returns a finite float in its range or raises `ValueError`: non-numeric, boolean, NaN or infinite input, an angle beyond 1e12 deg, an empty or non-list/tuple collection or one longer than 1,000,000, a mean resultant length below 1e-9.

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_wrap_0_1_0,
  author  = {Cavazzini, Andrea},
  title   = {{star-wrap}: Reducing, differencing and averaging angles},
  version = {0.1.0},
  year    = {2026},
  url     = {https://andrea07072000.github.io/S.T.A.R.-/software/star_wrap/},
  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