Compliance sheet — star-euler

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

1. Identity

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

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

FILE	SHA-256
star_euler-0.1.0-py3-none-any.whl	c2ee414f66a5e8ce7ef45b92653da0788ede74cc530dbdb44bcc812795aed052
star_euler.py	a43e4c7faa5b0fbc71e02a9076d389eda37416bf772118e52d512fb30f371201
star_euler-0.1.0-source.zip	b455eeb0f06ce8d163f21efb5467c7975838a8c948c3634597b3591de19cd1d6

5. What it does, and its limits

Rotation matrix from three Euler angles and back for the six Tait-Bryan and six proper sequences, with one stated convention (active, intrinsic), gimbal lock detected and reported; agrees with SciPy and NAIF SPICE to 6e-16 on all twelve sequences.

No extrinsic (fixed-axis) sequences as a separate option: reverse the letters and the angles to get them. No angular rates or kinematic equations. Within about 1e-7 degrees of gimbal lock the first and third angles are not separable and only their combination is returned.

- Convention: ACTIVE, INTRINSIC rotations: `to_dcm("ZYX", a1, a2, a3) = Rz(a1) Ry(a2) Rx(a3)` (turn about Z, then about the new Y, then about the new X). This is SciPy's upper-case sequence; NAIF SPICE `eul2m` returns the transpose.
- `from_dcm(seq, R)`: middle angle in [-90, 90] (Tait-Bryan) or [0, 180] (proper), the others in (-180, 180]. At gimbal lock the third angle is returned as 0 and the first carries the whole rotation; `is_singular` reports it.
- Measured against SciPy and SPICE for all twelve sequences (720 regular cases, 24 at gimbal lock): matrices within 6e-16 (bit-identical to SPICE), angles within 4e-13 degrees, matrices rebuilt at gimbal lock within 6e-16.
- Every function returns finite floats or raises `ValueError`: a sequence that is not one of the twelve (lower case included: it is not guessed), non-numeric, boolean, NaN or infinite input, a matrix of the wrong shape, not orthonormal to 1e-9, or a reflection.

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_euler_0_1_0,
  author  = {Cavazzini, Andrea},
  title   = {{star-euler}: Euler angles for the twelve sequences, one convention},
  version = {0.1.0},
  year    = {2026},
  url     = {https://andrea07072000.github.io/S.T.A.R.-/software/star_euler/},
  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

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