Compliance sheet — star-mrp

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

1. Identity

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

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

FILE	SHA-256
star_mrp-0.1.0-py3-none-any.whl	7289c9375b2cc3a3c7c83fb36852785963ee2d8f41f319e0ee5027b9c4e22875
star_mrp.py	dd6d256d9a3a171e89e377271cc6e8d48ecb22661109db2db20453cefd25af04
star_mrp-0.1.0-source.zip	14f506a3a33acb73dfd0a3030cc75f406ef6f2daab530b0593c072fac9fa234b

5. What it does, and its limits

Modified Rodrigues parameters: conversion with quaternions, direction cosine matrices and rotation vectors, shadow set and switching, composition of rotations through quaternions (no division by zero at a full turn) and the kinematic equation; within 6e-16 of Basilisk and 2e-15 of SciPy on 601 pairs with norms from 1e-8 to 5.

Kinematics only: no dynamics, no control law, no integrator (`mrp_rate` is the right-hand side; integrating it and switching to the shadow set is left to the caller). At exactly half a turn the two MRPs of norm 1 are equally short and either may be returned. No Gibbs vector (classical Rodrigues parameters), no Euler angles (see star_euler). No published numerical table is reproduced: the references are cited for the formulas.

- `mrp_from_quaternion`, `quaternion_from_mrp`, `dcm_from_mrp`, `rotation_vector_from_mrp`, `mrp_from_rotation_vector` convert between sigma = e tan(phi/4) and the other representations; `shadow` and `switch` give the other MRP of the same attitude; `compose(first, second)` chains two rotations; `mrp_rate(s, omega)` is the kinematic equation.
- Quaternions are scalar first; the matrix takes reference to body; results of conversions and of `compose` are on the short rotation (|sigma| <= 1, quaternion with w >= 0, angle in [0, pi]). `compose` goes through quaternions, so two rotations that add up to a full turn give zero and not a division by zero.
- Measured on 601 pairs of MRPs with norms from 1e-8 to 5 (a third beyond 1): eight operations agree with Basilisk within 6e-16 and seven with SciPy within 2e-15.
- Every function returns floats or raises `ValueError`: vectors that are not three (or four) finite real numbers within 1e150, a zero quaternion, the shadow of the zero MRP, a threshold that is not positive.

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_mrp_0_1_0,
  author  = {Cavazzini, Andrea},
  title   = {{star-mrp}: Modified Rodrigues parameters},
  version = {0.1.0},
  year    = {2026},
  url     = {https://andrea07072000.github.io/S.T.A.R.-/software/star_mrp/},
  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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