Compliance sheet — star-horizon

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

1. Identity

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

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

FILE	SHA-256
star_horizon-0.1.0-py3-none-any.whl	da8f0206eddaa2cf077394930ec6bb09d86023882dfa8f17a708780c75115fed
star_horizon.py	ff7979c40689f8ca534d3e396c77dbe9c1838bdecdbe88188bd4223903534534
star_horizon-0.1.0-source.zip	3a52f81b255cbe94d493453bbeb952e259bb5e797b0798832c5c63d915347bf0

5. What it does, and its limits

Azimuth and elevation from hour angle, declination and latitude, the inverse, and the parallactic angle; agrees with ERFA and a SPICE rotation to 1.1e-13 deg on 600 cases in both directions and refuses out-of-range input.

No refraction, parallax, aberration, polar motion or deflection of the vertical: this is the geometric direction. The parallactic angle is compared with one library (ERFA), with the same formula: the agreement shows the same convention, not an independent derivation. The SPICE lineage uses SPICE routines composed in the driver. At the zenith or nadir the azimuth is undefined, at a celestial pole the hour angle is undefined, at the zenith the parallactic angle is undefined: 0 is returned there.

- `hadec_to_azel(ha, dec, lat)` returns azimuth from North through East in [0, 360) and elevation; hour angle is positive West of the meridian. Reproduces Meeus Example 13.b.
- `azel_to_hadec(az, el, lat)` is its inverse, with the hour angle in (-180, 180]; `parallactic_angle_deg(ha, dec, lat)` is the angle at the object between the pole and the zenith, in (-180, 180].
- Measured on 600 cases (100 down to 1e-6 deg from the zenith, 100 at latitudes down to 1e-6 deg from a pole), in both directions: within 1.1e-13 deg of ERFA and of a SPICE rotation; parallactic angle identical to ERFA.
- Every function returns finite floats or raises `ValueError`: non-numeric, boolean, NaN or infinite input, hour angle or azimuth outside [-360, 360], declination, elevation or latitude outside [-90, 90].

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_horizon_0_1_0,
  author  = {Cavazzini, Andrea},
  title   = {{star-horizon}: Hour angle and declination ⇄ azimuth and elevation},
  version = {0.1.0},
  year    = {2026},
  url     = {https://andrea07072000.github.io/S.T.A.R.-/software/star_horizon/},
  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