

X74a **JAXBIS: the JASMINE astrometric solver capable of delivering high-precision astrometry of the Nuclear Stellar Disc**

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The upcoming Japan Astrometry Satellite Mission for Infrared Exploration (JASMINE) will provide proper motions and parallaxes for the highly-obscured and reddened stars in the central-most parts of our Galaxy, which are crucial to disentangle the origin of the different components that co-exist in the inner-most ~ 200 pc like the Galactic bar and the Nuclear Stellar Disc. Since optical wavelengths are blocked by dust, JASMINE observes in the near infrared, a band for which high-precision astrometry is just becoming feasible. As such, the data reduction will require extensive testing, assessing the performance of our models of the optics and detectors against different foreseeable scenarios like periodic thermal fluctuations, permanent deformations of the frame, or chromatic effects. We have designed an iterative Least Squares solver that can process billions of observations and millions of parameters while relying on auto-differentiation to bypass the need to recalculate the analytical derivatives of our changing calibration models. In this contribution, we present our novel software and the results of the first full-mission scale test, which will demonstrate, among other things, how JASMINE parallaxes can help separate our targets, located 8 kpc away, from the foreground stars beyond 5 kpc where Gaia can no longer observe stars. Thanks to its use of auto-differentiation and unique algorithmic structure, it is highly scalable and adaptable, making it very easy to adopt by other missions.