

JASMINE-position reconstruction

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We introduce a Japanese plan of infrared space astrometry(JASMINE-project) operating at z-band whose central wavelength is 0.9 micron. JASMINE is the satellite (Japan Astrometry Satellite Mission for INfrared Exploration) which will measure the distances and apparent motions of stars in the Milky Way with yet unprecedented precision. It will measure parallaxes, positions with the accuracy of 10 micro-arcsec and proper motions with the accuracy of 10 micro-arcsec/year for stars brighter than $z=14$ mag. JASMINE can observe about ten million stars belonging to the bulge components of our Galaxy, which are hidden by the interstellar dust extinction in optical bands. Number of stars with $\sigma/\pi < 0.1$ in the direction of the Galactic central bulge is about 1000 times larger than those observed in optical bands, where π is a parallax and σ is an error of the parallax. With the completely new map of the Milky Way, it is expected that many new exciting scientific results will be obtained in various fields of astronomy.

Presently, JASMINE is in a development phase, with a target launch date around 2015. We adopt the following instrument design of JASMINE in order to get the accurate positions of many stars. We adopt a 3-mirrors optical system(modified Korsch system)with a primary mirror of < 1 m. On the astro-focal plane, we put dozens of new type of CCDs for z-band to get a wide field of view.

The accurate measurements of the astrometric parameters requires the instrument line-of-sight highly stability and the opto-mechanical highly stability of the payload in the JASMINE spacecraft. The consideration of overall system(bus) design is now going on in cooperation with Japan Aerospace Exploration Agency(JAXA).

We will show technological needs in JASMINE, especially critical technical issues in the observing strategy, astrometric data reduction, the instrument design and a preliminary design of the spacecraft system.