

## A TWIN REFLECTING ASTROGRAPH

K. Tomita  
Astronomical Society of Japan  
4-11-20 Yoga Setagaya, Tokyo  
Japan

K. Takahashi  
Takahashi Optical Co.  
Ohara Nerima, Tokyo  
Japan

**ABSTRACT.** A newly developed catadioptric optical system and a modified yoke-type equatorial mounting were designed and constructed. This telescope will be installed at Saipan Island for observing Comet Halley in Feb.-Apr. 1986.

### 1. OPTICAL SYSTEM

An optical system consisting of a hyperbolic mirror and a simple lens corrector was designed and manufactured featuring a wide field and a small focal ratio.

The reflecting system, which is 30 cm in aperture and 113 cm in focal length (F/3.76), has an unvignetted flat field of 3° in diameter, using 70 mm roll-films at the Newtonian focus.

The image quality at the field margin is 20  $\mu\text{m}$  in the wavelength region of 380-680 nm. The image shape is symmetric so that it is suitable for precise position measurement.

### 2. MOUNTING

A modified yoke-type equatorial mounting supports two optical systems, one of which can be offset up to 5 degrees both in right ascension and declination.

The tracking around the polar axis is performed by means of two ball screws, which are rotating oppositely to each other and are employed alternately. They are driven by a pulse motor controlled by a micro computer. There is also a ball screw around the declination axis in order to track a high-velocity object.

Applications of this twin telescope include photographic observations of extended tails of comets with an offset telescope and simultaneous two color or polarization observations of the same field. A set of two photoelectric photometers is available, and so simultaneous continuous observations of an object and a comparison star are possible.

### 3. OBSERVATION OF HALLEY'S COMET

When Halley's Comet approaches the Earth in February to April, 1986, the twin equatorial telescope will be installed at Saipan Island (latitude 15°N, longitude 146°E) to observe the comet. The weather on the island is reported to be very fine in that season.

### 4. REMARKS

Similar systems with smaller apertures (20, 16 and 13 cm) are commercially available as TAKAHASHI EPSILON SERIES.

The authors are greatly indebted to the support by a Grant from the MAINICHI NEWS PAPER CO. and to the Shinwa Optical Co. and Norizuki Giken Co. for the construction of the mounting.