A 75cm ALT-AZ TELESCOPE WITH SHORT TIME FOCUS EXCHANGING SYSTEM

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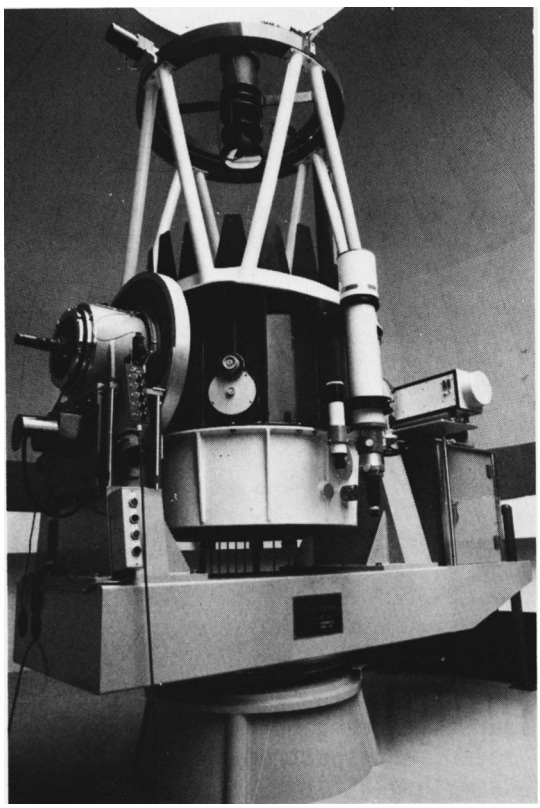
ABSTRACT. The Sundai senior high school built a telescope with an alt-az mounting and an aperture of 75cm. A photographic camera at the prime focus, and an SIT camera, a photomultiplier, and a spectrograph at the Nasmyth focus are prepared. Time needed for the exchange between instruments is in less than a minute. Therefore, effective observations are performed by changing the instruments which are proper for the sky condition at the observed night.



The telescope of the Sundai Observatory at Kita-Karuizawa(SOK) is not only the first real alt-az telescope in Japan, but also the first working telescope with honeycomb primary mirror in the world produced by Roger Angel at the Steward Observatory. The PC-8800 micro-computer with 8 bits controls its pointing and driving in an accuracy of 0!5 and 6" in open loop, respectively. There is a flip-flop top ring between the primary and Nasmyth foci which makes a quick exchange between two foci possible. However, this system gives only tight space for an instrument of the prime focus which is a photographic camera. There are two Nasmyth foci between which one can change by tilting the tertiary mirror in 90^{0}. Since the telescope was built for school pupils to look at planets, stars, nebulae, and clusters, one of the Nasmyth focus is used for only

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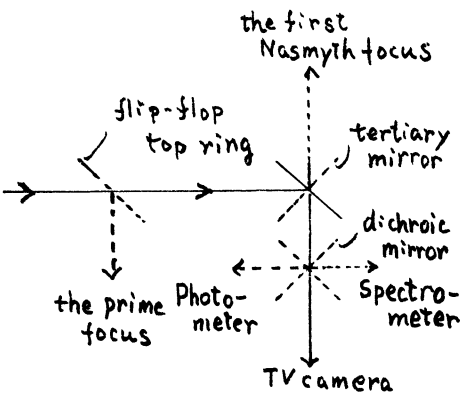
eye observations. At the other Nasmyth focus, there is the Nasmyth platform which does not change height during the equatorial motion because of the alt-az mounting. Three instruments are permanently fixed on the platform. An SIT camera on the line of elevation axis is set on an instrumental rotator to conpensate the field rotation because of alt-az mounting. We are able to obtain two dimensional images down to the 15th magnitude with 1 minute integration of a real time frame memory. In front of the Nasmyth focal plane, a dichroic mirror is inserted to give stellar light into either a photomultiplier or a spectrometer. This kind of change is done in a few seconds. The photometer contains normal U, B, V filters and the other 3 filters will be set. The spectrometer has dispersions of 20A/mm and 200A/mm. Using a detector with 3 stage microchannel plate and MOS camera, we are able to observe down to 12th magnitude in 10 minute integration. Since the observational site is not good enough, our system for exchanging observational instruments in short time makes effective observations possible.



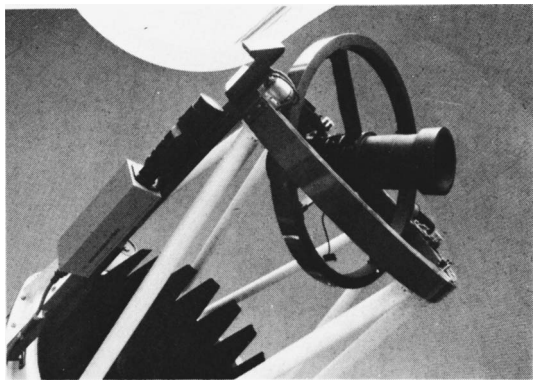


Figure 2. A flip-flop top ring between the Prime and Nasmyth foci.

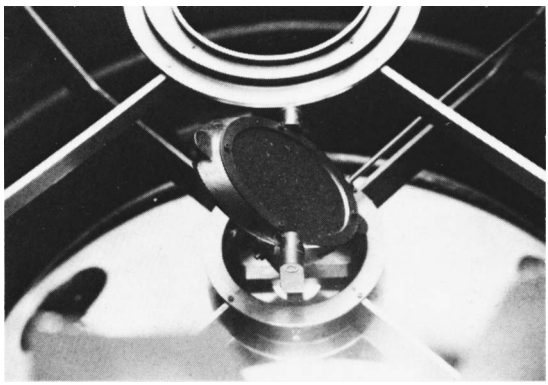


Figure 3. The tertiary mirror set on the elevation axis.

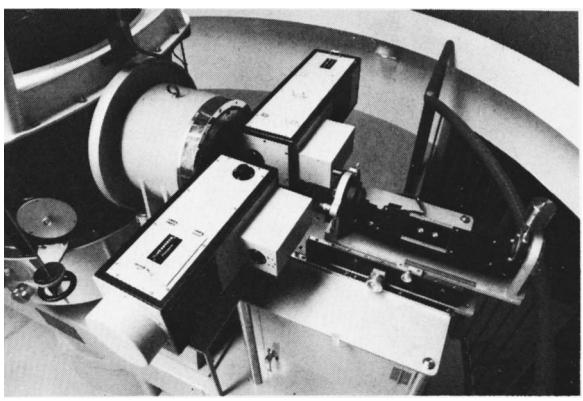


Figure 4. Arrangement of SIT, photometer, and spectrometer on the Nasmyth platform.

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