TSMKOLLI

User’s Manual

How does TSMKOLLI work?

TSMKOLLI is a compact optical system that makes an image together with the optical elements of the telescope. The collimator contains four LEDs and a lens objective. LEDs form glare on each optical surface of the telescope. Collimation of the telescope is carried out by bringing these highlights into a concentric picture.

You can observe this image through the eyepiece. Depending on the type of the optical system and the focal length of the telescope, you will need to choose the optimal magnification. To do this, use different eyepieces or a combination of them with a Barlow lens.

But it will be much more convenient to use the camera to display the image built by the collimator on the computer screen. In this case, the adjustment process becomes much more simplified.

To adjust the astrograph, it is useful to install some kind of a light filter in the 1.25” barrel. This will allow you to get an additional set of highlights. In this way it will be possible to check the correct installation of the telescope's focuser.

Preparation for collimation

Place the tube horizontally on a table or use a telescope mount. Provide easy access to the adjustment screws. Be aware that an accidentally dropped hex wrench or screwdriver can damage the optics of the telescope. Therefore, be careful and install the telescope in such a way as to completely the possibility of damage to the optics.

Install the light filter in the barrel of the collimator and connect the 12V power supply. The collimator is equipped with a simple threaded focuser. It can be used to focus an eyepiece or a camera. Loosen the retaining ring and achieve precise focus by rotating the eyepiece tube. Then tighten the retaining ring back. With compact 1.25” format guiding cameras, you can additionally obtain a large focus range by simply moving the camera body inside the eyepiece tube.

Start the collimation

Having adjusted the collimator, try to rotate the cell screws of each of the optical elements, carefully observing how the position of the flares changes. At the first stage, it is necessary to figure out which optical surfaces each set of reflections was obtained from.

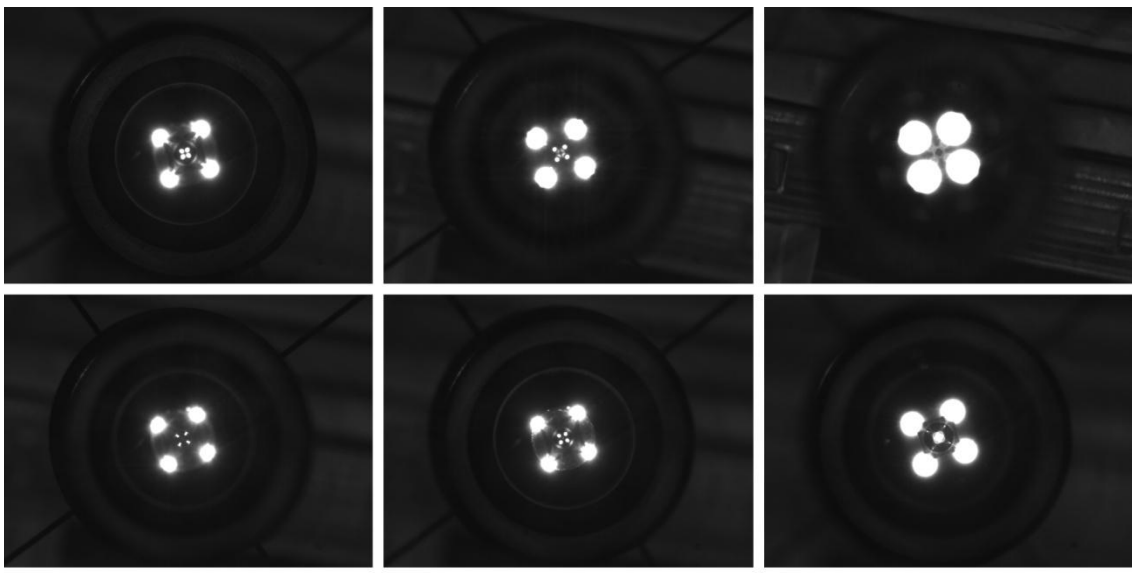

Image from a reflector telescope

Next, you should reduce the highlights into a concentric picture. If your telescope has been heavily misaligned, this will need to be done in several iterations. When you have achieved a concentric picture, tighten the locking screws of the mirror or lenses cells. Next, you should check all the mechanical components of the telescope in order to understand which part is most prone to misalignment.

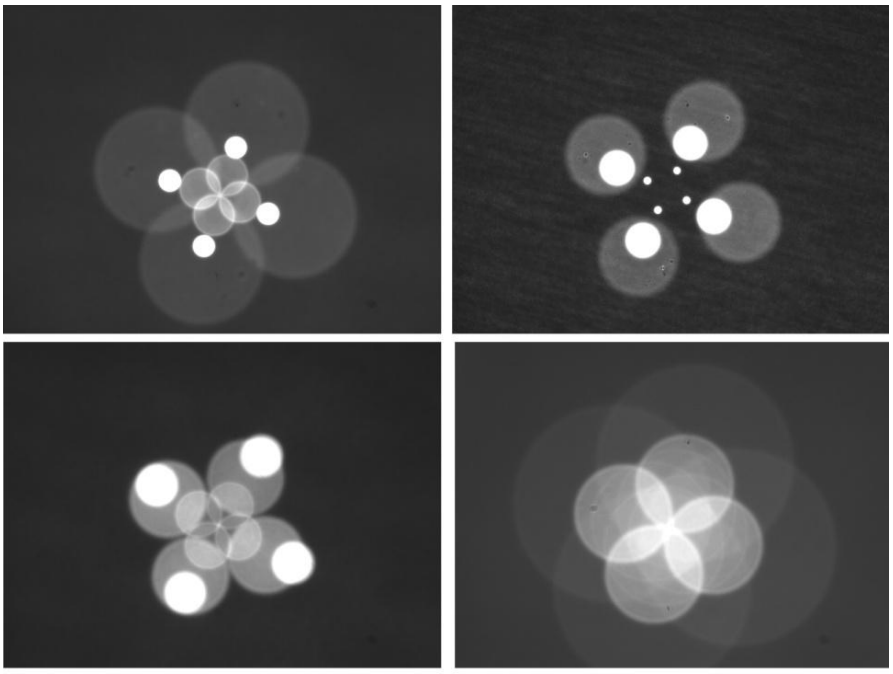

Image from a refractor telescope

Telescope focuser Check the focuser in the entire range of its movements. If the mechanical axis of the focuser coincides with the optical axis of the telescope then the glare in the collimator will only change its shape or brightness without losing concentricity. If you find that the image becomes asymmetric, then you need to adjust the focuser.

If you use a telescope for astrophotography and put a huge load on the focuser, you should check the backlash of the moving tube. Many Crayford focusers in low-cost telescopes suffer from noticeable displacement of the moving tube. Try to push the focuser tube in different directions with some force, simulating the weight of the equipment installed on it.

OTA and mirror cell in reflectors Many inexpensive telescopes have problems with their primary mirror cells. As the tube rotates on the mount, the mirror may move and cause misalignment. To check this, mount the telescope tube on the mount along with a collimator equipped with a camera. Rotate the telescope tube in different directions and watch the glare pattern on the monitor. If there are misalignments of the mirrors in the frames or some other backlash, they will quickly appear on the screen.

The only way to fix this is by adjusting the mirror's cell. When doing this, remember the need for temperature gaps and proper unloading of the mirror. Excessive clamping of the mirror in the cell can lead to astigmatism.

Remember that any collimator is only an auxiliary tool for adjusting the telescope. The most reliable check of collimation will always be real observations or imaging of celestial objects. So clear skies and good observations!