Review of the DGM Optics OA-4.0 Off-Axis Newtonian Telescope

The following specifications are a result from testing the DGM Optics OA-4.0 (98.5mm clear aperture, F/10) Off-Axis Newtonian telescope as a system:

1] Wave front- 0.125 wave (1/8)

2] Strehl ratio- >99%

3] Resolution- 1.1 arc sec

4] Transmission- >90%

5] Central obstruction- none

No 4" design telescope that I have ever tested, or been witness to testing, performed as well as the DGM Optics, OA-4.0, Off-Axis Newtonian reflector.

Field Tests

I have many telescopes available to me for laboratory and field-testing, and side by side (in the field) visual comparison tests. Here are the telescopes that were used for such tests:

1. 4" F/10 Maksutov
2. 4" F/10 Newtonian, 10% central obstruction
3. 4" F/10 achromatic doublet
4. 4" F/8 Triplet/Fluorite
5. 4" F/15 achromat doublet
6. 4" F/10 Fluorite
7. 4" F/8 ED

The above telescopes have been previously laboratory tested and optimized for excellent performance. Since most of the telescopes have the same focal ratio, the use of the same eyepiece (no diagonal introduced), and preservation of the exit pupil are important factors. The range in magnification used was 32X to 255X on stellar objects, and up to 408X for lunar features. **See Note below.

At 32X, across a 2 degree field of view, the OA-4.0 exhibited no image defects across its field. The images were sharp to the edge of the field, and the contrast was clearly better than any telescope along side it. The high contrast yielded fainter stars than any of the 4" comparison telescopes. Along the earthshine (lunar edge) were several faint stars, 12+ magnitude, that were not seen in any of the other telescopes at 32X to 64X; but were seen in the OA-4.0. The dark sky

views and the limiting magnitude suggest that this is a 5.5 to 6 inch aperture telescope, not 4"!

Double stars of similar and different colors were viewed at 85X to 160X. The most striking difference between the telescopes was that the color provided by the OA-4.0 was more apparent than in the other telescopes. For other double stars, the absolute "black" shown by the OA-4.0 allowed close pairs to be discerned; where the other telescopes favored higher magnification use to accomplish the same task.

The lunar observations were perhaps the most revealing of all. Since this object provides an outstanding source for features of known resolution, and the terrain, shadows and phase angle provide a variety of contrast differences. The OA-4.0 and others showed an enormous wealth of details at low magnification. It became apparent that the OA-4.0 provided more "dimension" and "texture" of the lunar surface at 160X upwards. The shadows and shades of gray were best discerned by the OA-4.0. While the other telescopes showed fine discrete lunar features at 200X, the OA-4.0 revealed an additional "texture" to the surrounding areas studied.

While I am a skilled observer and do not require high magnifications to see all that a telescope can provide, I did "push" all the telescopes to 100X per inch on the moon. At these magnifications, all the telescopes (except the DGM Optics, OA-4.0) showed a softer image, reduced contrast, and more focus travel to see differences in the sharpness of a crater or peak. Since the OA-4.0 failed to breakdown, the OA-4.0 was set to the highest magnifications to find its limit. **NOTE: Using a 2.8X Klee Barlow, a 4mm orthoscopic eyepiece, a magnification of 714X was obtained. Another combination used a 3mm Clave with the Klee Barlow, yielding 952X.

This extreme magnification demonstrated several issues:

1. The OA-4.0 still showed details that would readily go through focus, even at 714X. At 952X, the image finally became lost in the very low contrast and brightness factors at an effective F/238!

2. The best (premium) refractors did show color, contrast, and image breakdown after 75X per inch.

3. The obstructed systems showed contrast and brightness loss after 60X per inch.

Conclusion

This sample 4" F/10 Off-Axis Newtonian, by DGM Optics, stands alone as the finest optical system at 4 inches of aperture I have seen worldwide.

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