SpotOptics

The software people for optics

Precision of Alisa with the new USB2 camera

October 2005

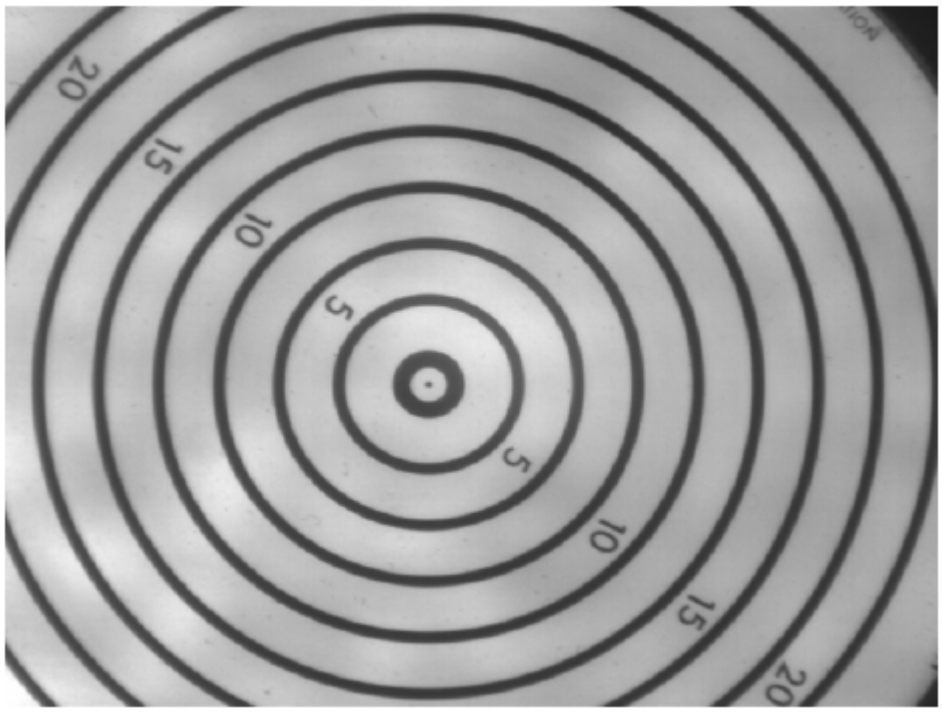
1. New camera for Alisa

SpotOptics has decided to replace the Firewire camera being used previously with Alisa with
a new USB2 camera. This has the same number of pixels (1280x1024) but with a smaller
pixel size (6.7µ instead of 7.5µ), giving a slightly higher resolution and accuracy. Moreover,
it can be used with standard USB2 ports, which is very convenient (e.g. for use with a laptop).
The Firewire camera required a special card.

2. Accuracy with the new camera using the micro alignment telescope (MAT) of Taylor Hobson

The accuracy obtained with the new camera was evaluated in the following way:
1. A target was mounted at a distance of 600mm from the MAT
2. Its image was obtained using the new camera and Alisa
3. It was then centered. This is Image1
4. The target was then moved by a very precise amount of 50µ using a Heidenhaim encoder
5. The image (now called Image2) was again recorded using Alisa
6. Alisa was then used to compute the displacement (Image2-Image1) using its own internal calibration (in µ)
7. The test was repeated 10 times and the average and standard deviation was computed
8. The results are reported below

Example of image obtained with new USB2 camera



Example of image obtained with new USB2 camera

3. Table with the measurements made by Alisa: 10 trials

DISPLACEMENT OF TARGET=50μ			
Measurements made by Alisa			
Trial#	**Down (μ)**	**Left (μ)**	**Total (μ)**
1	53.7	2.1	53.74105
2	54.4	2.4	54.45292
3	55.8	1.7	55.82589
4	55.3	2.3	55.34781
5	54.1	2.1	54.14074
6	54.5	0.7	54.5045
7	56	1.4	56.0175
8	53.7	1.4	53.71825
9	57.2	2.6	57.25906
10	56	2.6	56.06032
Average	55.07	1.93	55.1068
Standard deviation	1.17	0.618	1.177

Comments:
1. The accuracy obtained is very high with a standard deviation of only 1.18μ. *This is a*
testimony to how well Alisa works
2. While the movement of the target is 50μ, that measured by Alisa is 55.07μ. The small
difference can be attributed to the differences between the models of the MAT used for getting the internal calibration curve of Alisa with that used for the tests above. In any case, it is still of the order of 5μ, which is extremely difficult to get visually

4. Acknowledgements

We wish to thank Paul Jeffers of the 4m Vista telescope project of the Royal Observatory,
Edinburgh, UK for the above data obtained as part of the evaluation project of Alisa