Riccardi 0.75x M82 Reducer vs TS Photoline 0.75x Reducer Performance Comparison

1. Setup

All tests were performed using an APM LZOS 130 f/6 with an Atik 16200M CCD Camera (16MP, 35mm diagonal APS-H sensor). Three main comparisons were carried out: Edge of field sharpness, presence of internal reflections, and star FWHM

2. Edge of Field Sharpness

Both the Riccardi and TSRED exhibit good edge performance of the APS-H sensor. On closer inspection at 100% zoom, we can see that the edge performance of the TS reducer is slightly better than the Riccardi. All images were taken through a Baader Clear filter (50mm).
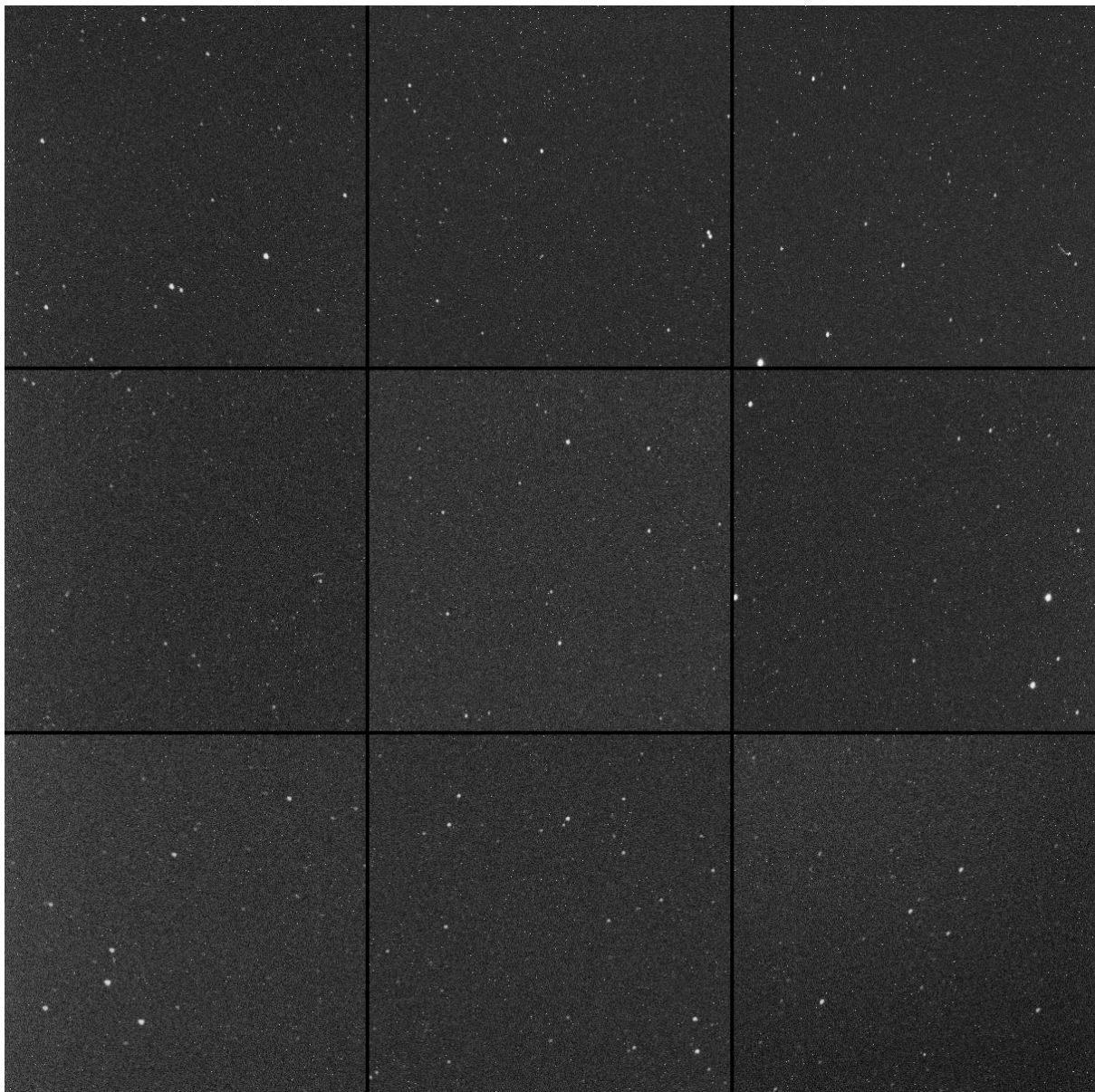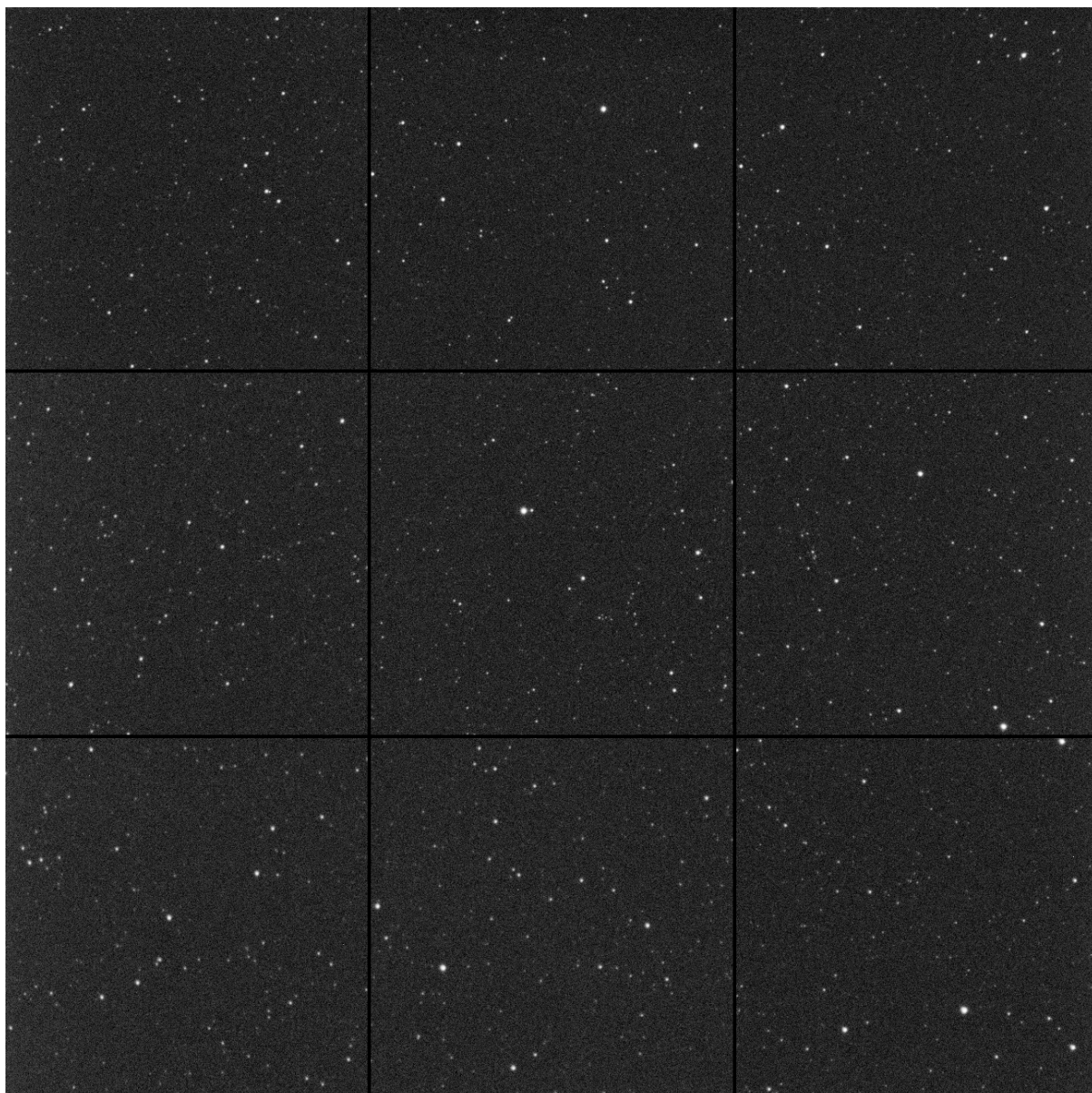

Fig 2.1 Riccardi M82 (400 px per panel)

Fig 2.2 TSRED 0.75x (400px per panel)

3. Internal Reflections

The Riccardi reducer exhibits extreme internal reflections at certain orientations that are not removable by flat fielding. The **TSRED shows absolutely no internal reflections**. Both images are a single 15-minute exposure of NGC 6188 taken through a 3nm Chroma SII filter.
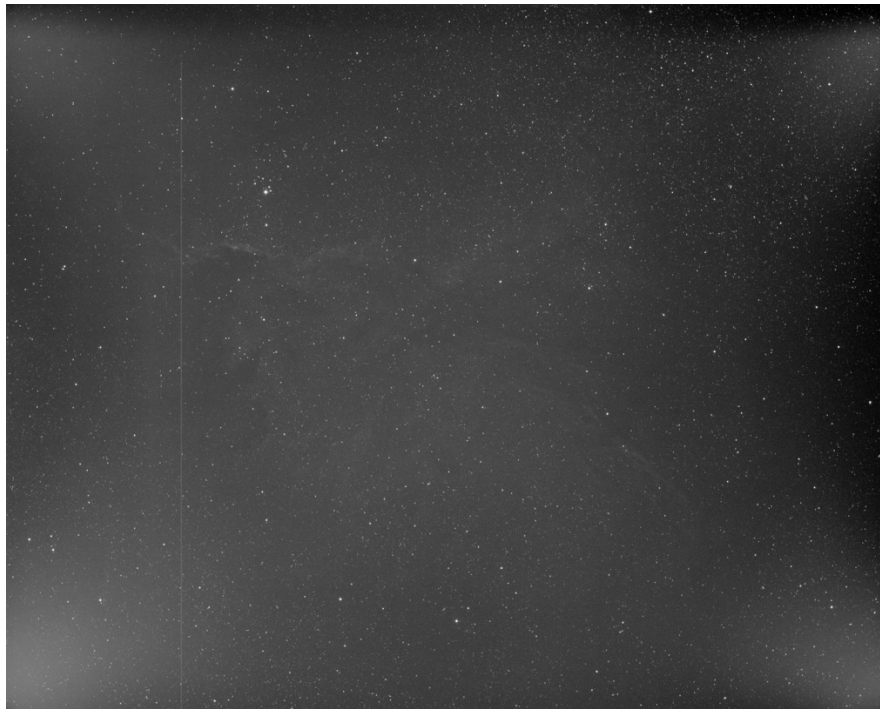

Fig 3.1 Riccardi Reducer. Note serious reflections from the corners.

Fig 3.2 TSRED 0.75x. Very clean image, no hint of internal reflections

4. Star Size Comparison

Star FWHM was compared between the Riccardi and TSRED using 2 sample images. Both were focused manually using a Bahtinov mask. A random sample of star pairs were taken from both images of the same target with a chroma 3nm filter and 15 minute exposure time.

Note that both image samples were taken on different nights, so the results may be affected by other factors such as seeing conditions and autoguiding precision. In this test, the **Riccardi was found to have slightly tighter stars**, both visually and measured based on FWHM measurements.

FWHM Sample Comparison (units in pixels)						Normalised (Riccardi=1)
M82 Riccardi			TSRED 0.75			
x	y	Mean (Geometric)	x	y	Mean (geometric)	
10.67	9.76	10.20	10.51	9.56	10.02	0.98
7.81	7.72	7.76	8.45	8.17	8.31	1.07
5.19	4.62	4.90	7.47	6.45	6.94	1.42
5.95	5	5.45	6.56	5.85	6.19	1.14
4.79	3.62	4.16	4.93	4.2	4.55	1.09
5.47	4.54	4.98	7.23	6.29	6.74	1.35

Table 4.1 Star FWHM comparison. Each row represents a different star

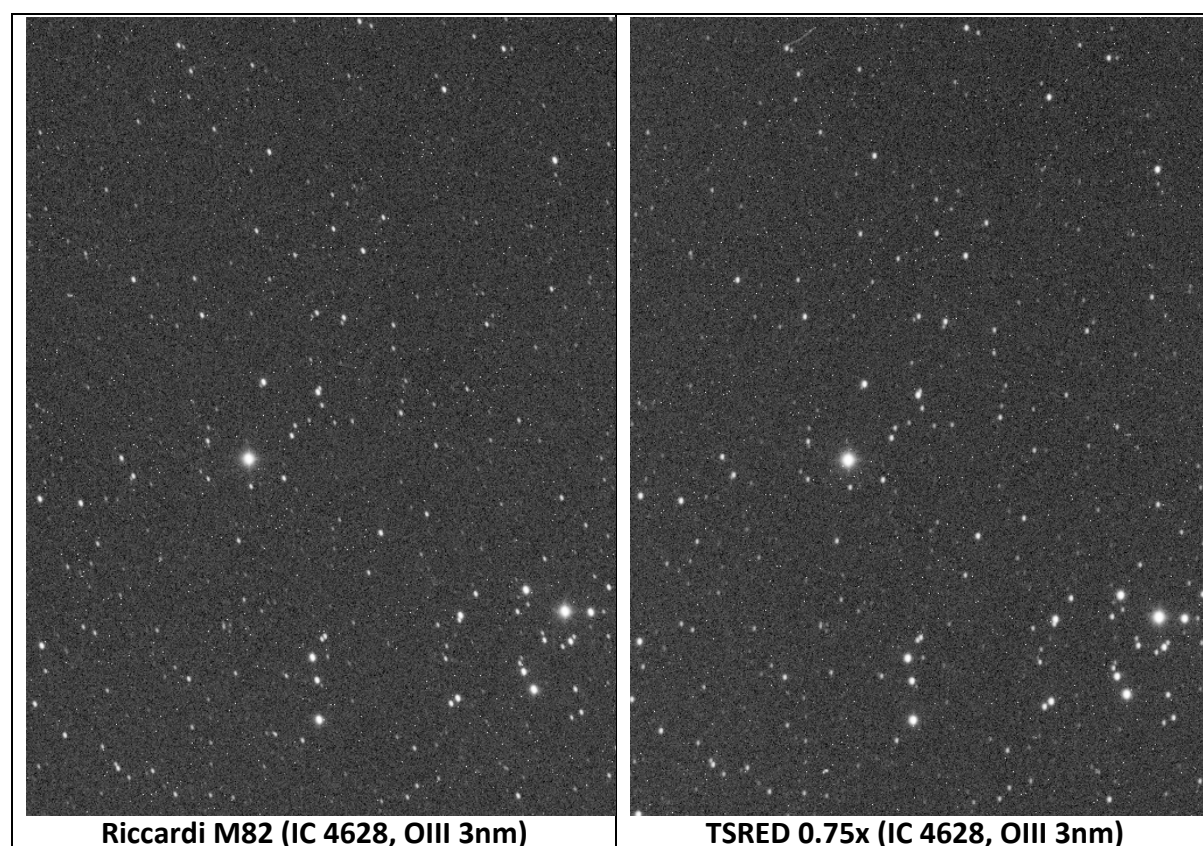| Riccardi M82 (IC 4628, OIII 3nm)	TSRED 0.75x (IC 4628, OIII 3nm)

Fig 4.1 Cropped Views of the Same region from both Setups