

## INTRODUCTION

- ▶ **Seeing** is the blurring of astronomical objects caused by atmospheric turbulence and variations in the refractive index of the air.
- ▶ **Light refracted** differently by a moving atmosphere causes varying image intensities and positions, reducing image quality and resolution.
- ▶ Good seeing conditions lead to **higher resolution** images.
- ▶ This project records and analyzes seeing at Ileret Observatory over multiple nights to assess suitability for high-resolution astronomy.

### SITE INFORMATION:

- ▶ Location: Turkana Basin Institute, Ileret
- ▶ Northeastern Kenya (4.28356°N, 36.26197°E, 449.8m a.s.l.)
- ▶ Low light pollution, semi-arid, clear skies.

## OBJECTIVES

- ▶ Analyze 40cm telescope data to obtain seeing values for the site.
- ▶ Obtain nightly averages for seeing
- ▶ Assess suitability for optical observations based on seeing values.

## METHODS

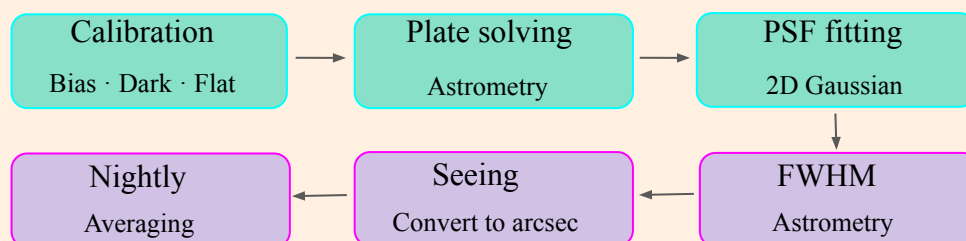
### Equipment:

- ▶ 40cm Sky-Watcher telescope with QHY174M-GPS detector and filter wheel

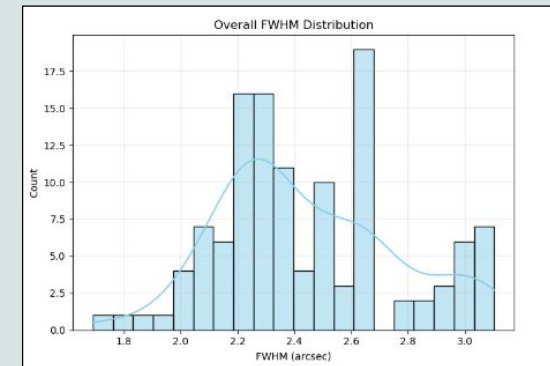
### Data (collected by DARA):

DATE	TARGET	N	FILTER	EXP
Jan 2025	RX-Eri	6	r-band	60.8s
Aug 2025	DY Her	4	r-band	60s

### Analysis pipeline:



## RESULTS

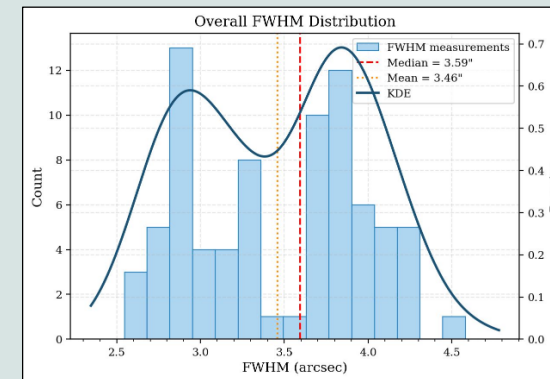


**Fig. 1:** FWHM histogram.

January 2025

**Median: 2.35"**

75% below 2.66"; 10% above 3.0"

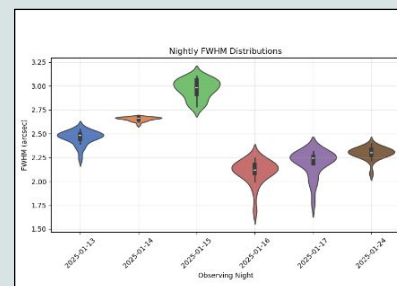


**Fig. 2:** FWHM histogram.

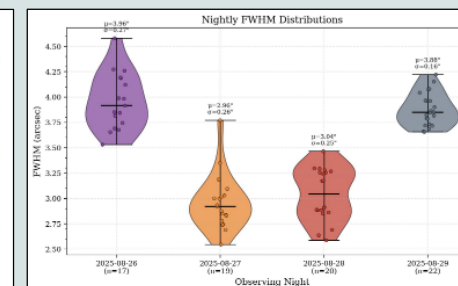
August 2025

**Median: 3.59"**

75% below 3.85"; 10% above 4.09"



**Fig. 3** Nightly distributions, Jan 2025



**Fig. 4:** Nightly distributions, Aug 2025

## DISCUSSION

**Note:** the best seeing conditions i.e Chile (Paranal) observatory has a median seeing of 0.6"-0.7". The lower the values the better.

### Key Statistics — RX-Eri (Jan 2025):

- ▶ **From Fig. 1:** The most occurring value is 2.66", and from 2D Gaussian fitting the distribution peak is 2.3"-2.4".
- ▶ 50% of the time the seeing was better than 2.35".
- ▶ This shows most seeing values between 2.2" and 2.6" with a peak around 2.35", with the best at 1.7", therefore, reflecting typical site conditions.
- ▶ **From Fig. 3:** The violin plots show nightly variation: 14 Jan 2025 shows the most stable conditions, while 17 Jan shows the most varying and 15 Jan worst seeing by having higher values.

### Key Statistics — DY Her (Aug 2025):

- ▶ **From Fig. 2:** It shows two groups of seeing values, one with 2D Gaussian distribution peak of around 2.9" and another around 3.8". Median 3.59" meaning half of the time the conditions were better than this. Seeing ranges from 2.5" best and 4.6" worst.
- ▶ **From Fig. 4:** Show clear nightly differences; Aug 27 shows best conditions, but also the most spread, indicating the most variable night. Aug 29th showing the most consistent conditions (~1.6")

Dataset	Target	Median	P75
Jan 2025	RX -ERI	2.35"	2.66"
Aug 2025	DY Her	3.59"	3.85"

## CONCLUSION

From this analysis, we show that Ileret has moderate seeing conditions. We could say that it is suitable for photometric work. We are still collecting data for more nights to add.

- ▶ Site shows moderate seeing suitable for photometric work.
- ▶ Seasonal variation evident: Aug 2025 not being the best, Jan doing good.
- ▶ Data collection ongoing across more nights and seasons to add more months.

**Future projects:** This is part of ongoing site testing at this site, we are working on adding extinction measurements and meteorological analysis.