



SITE TESTING AT MAO: RECENT RESULTS

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 - 4 meter telescope project
- Amount of clear nights
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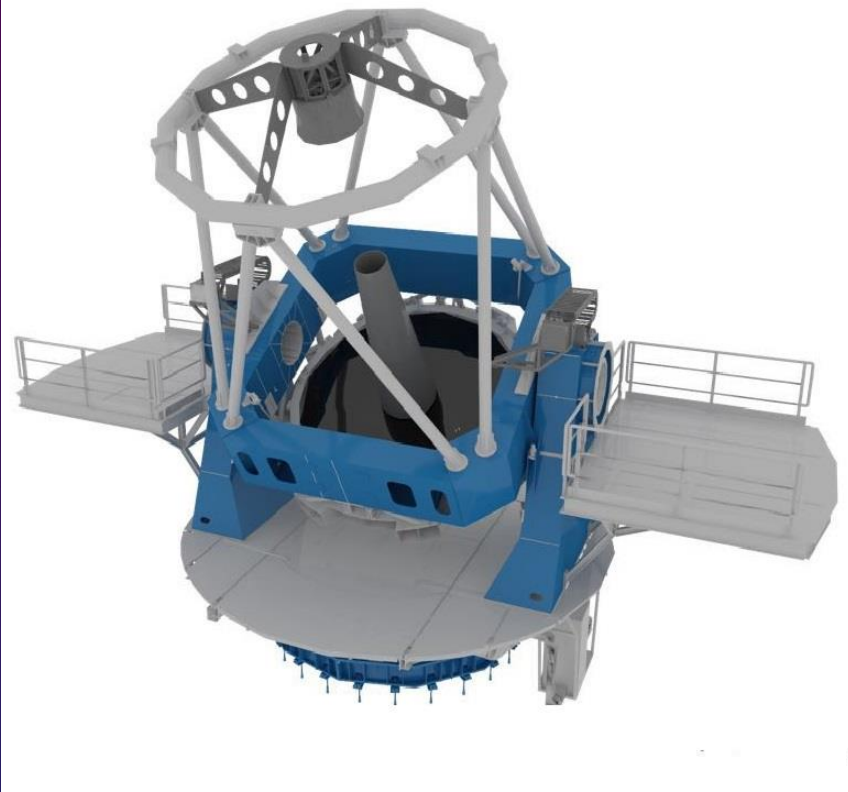
SUMMIT OF OIC ON SCIENCE AND TECHNOLOGY



4 M TELESCOPE INITIATIVE

- There is no optical telescopes more than 3m in Islamic countries
- Turkey's 4m telescope construction is appreciated
- To resume the fame of medieval scholars, in honor of Ulugh Beg it was recommended to install a 4 m telescope in Uzbekistan

4 M TELESCOPE OF DAG, TURKEY



The telescope costs ~50 mln.USD

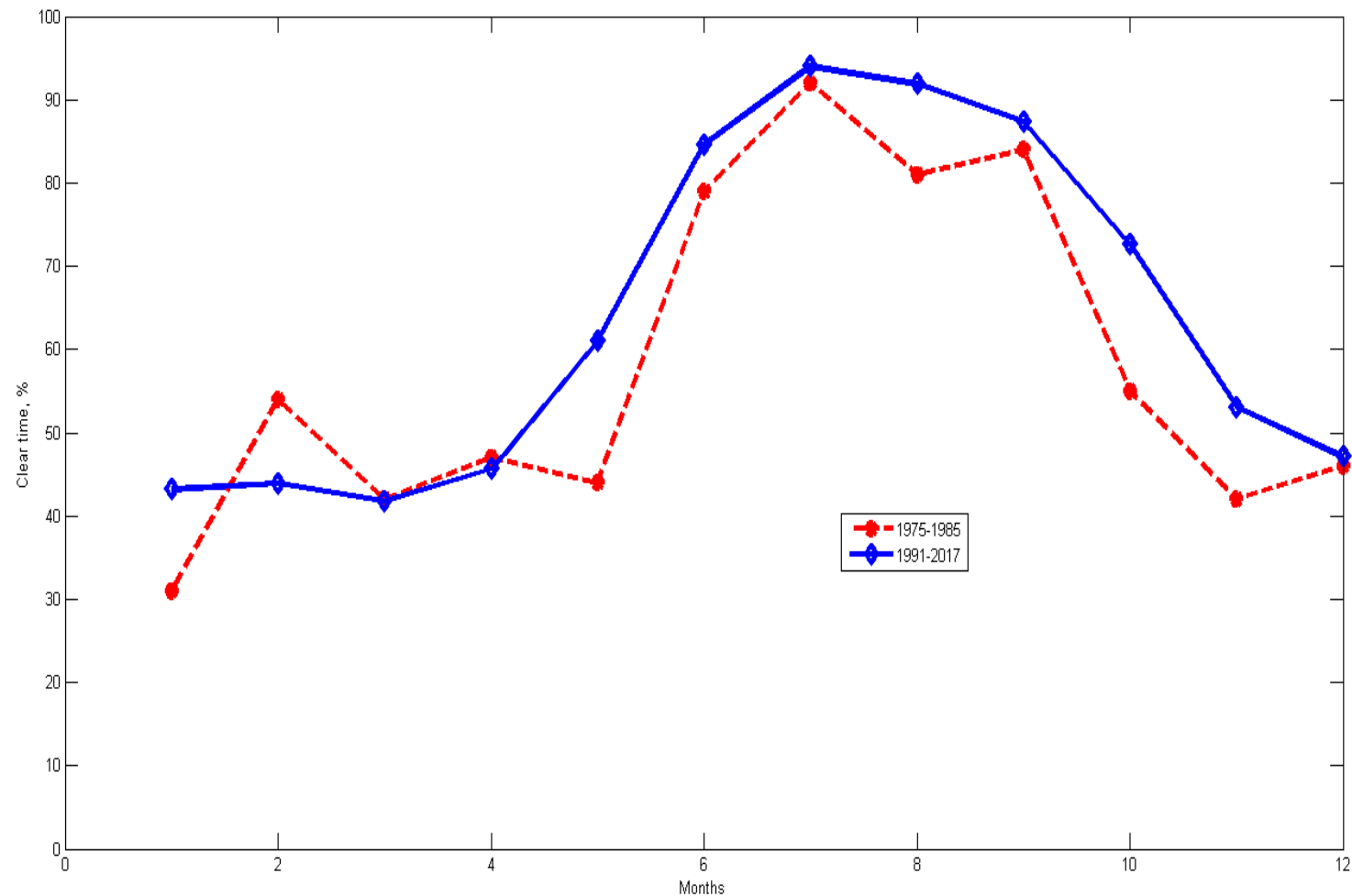


IMPORTANCE OF SITE TESTING MEASUREMENTS

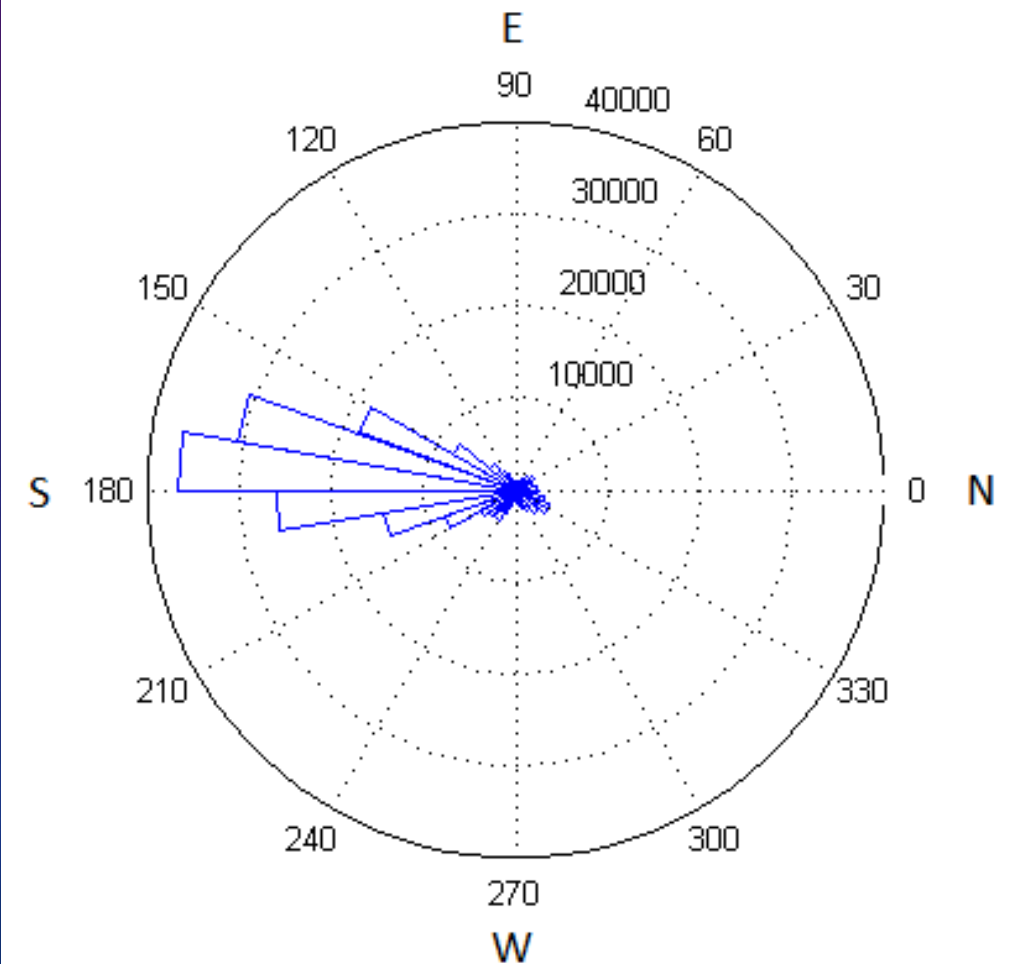
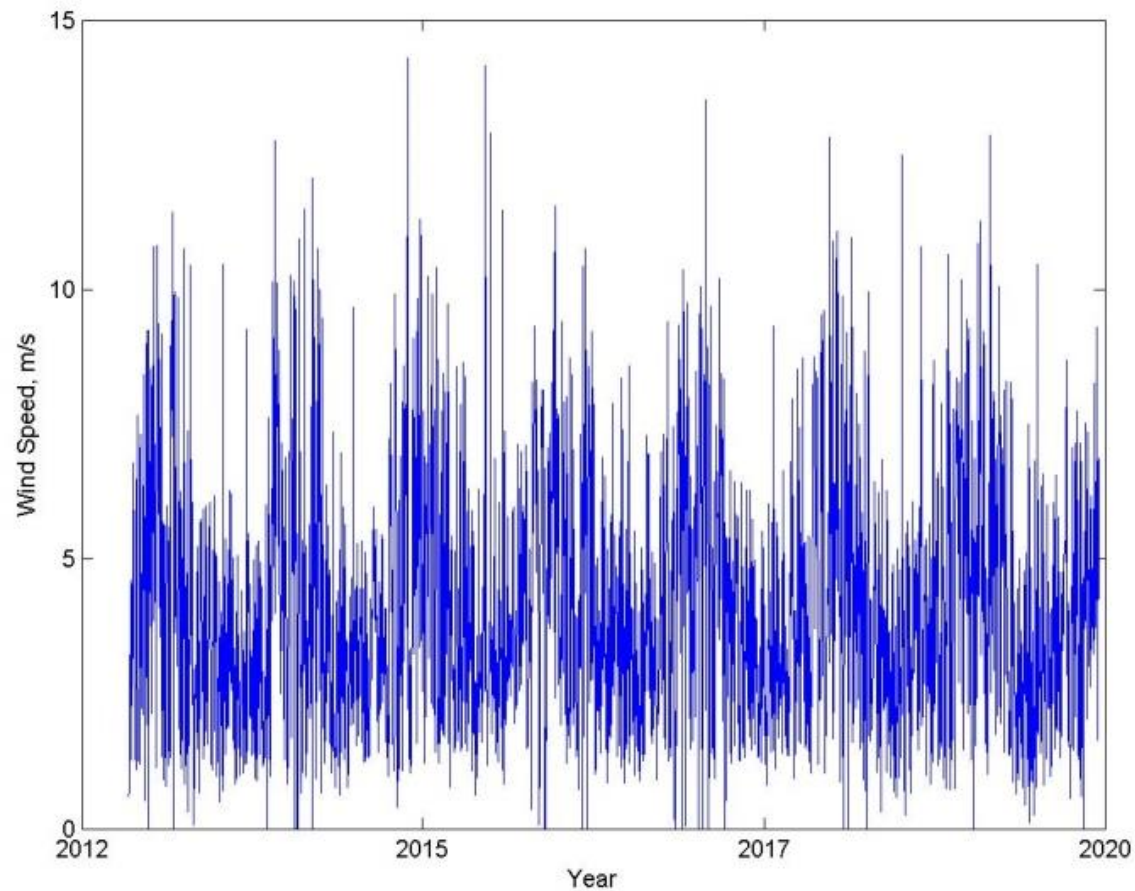
- Last site testing measurements carried out in the period 1996 – 2003;
- We had to resume site testing measurements in 2018 in order to get updated atmospheric parameters and choose an optimal place for new telescope;
- Renew statistics of amount of clear nights and meteorological parameters

AMOUNT OF CLEAR TIME (DATA OF 1991-2017)

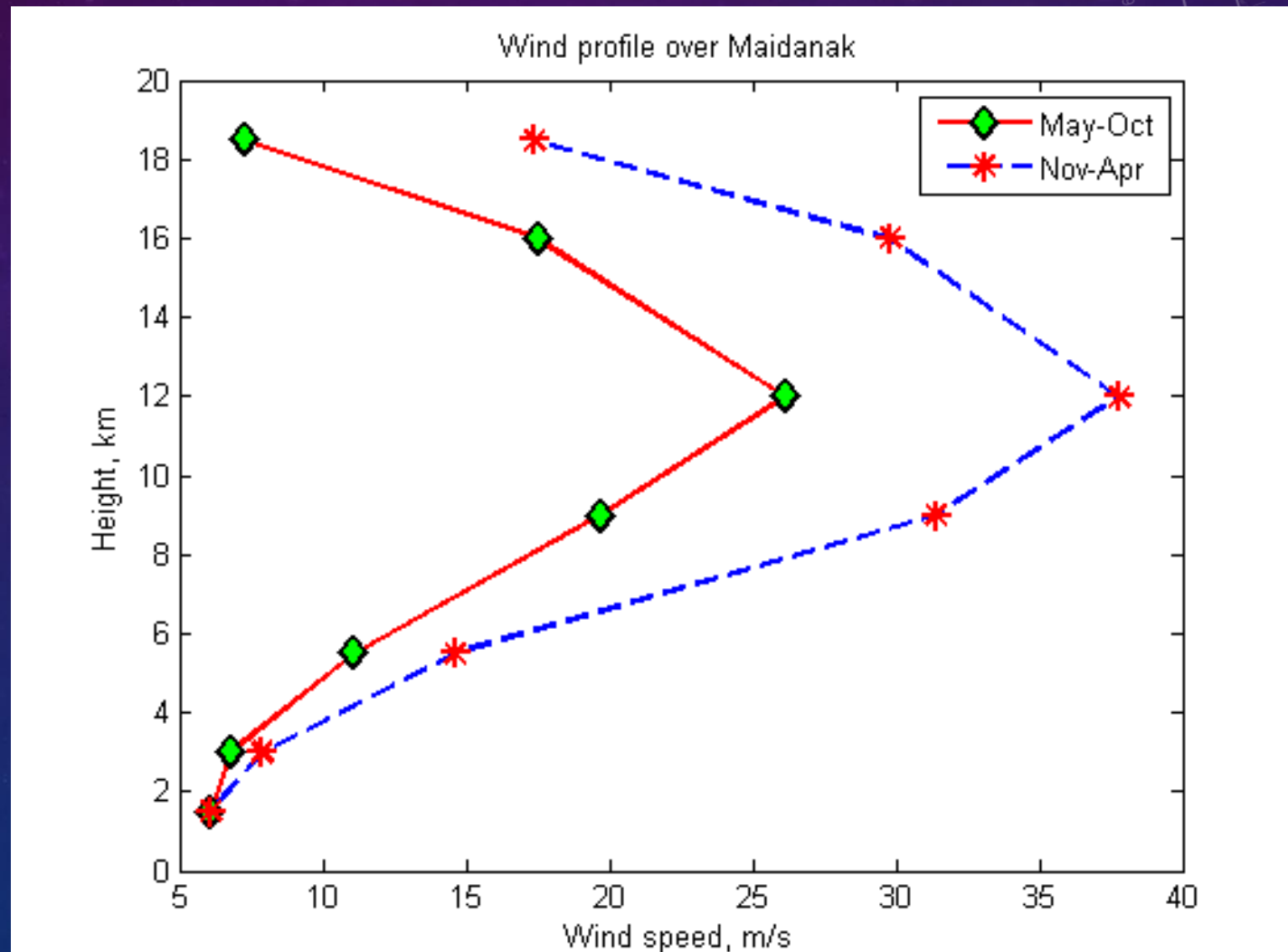
- New statistics of amount of clear nights based on 27-year-long database
- Maximum night-time hours are 3123 in 1 year
- Average clear time is 60.4 %
- 1870 hours



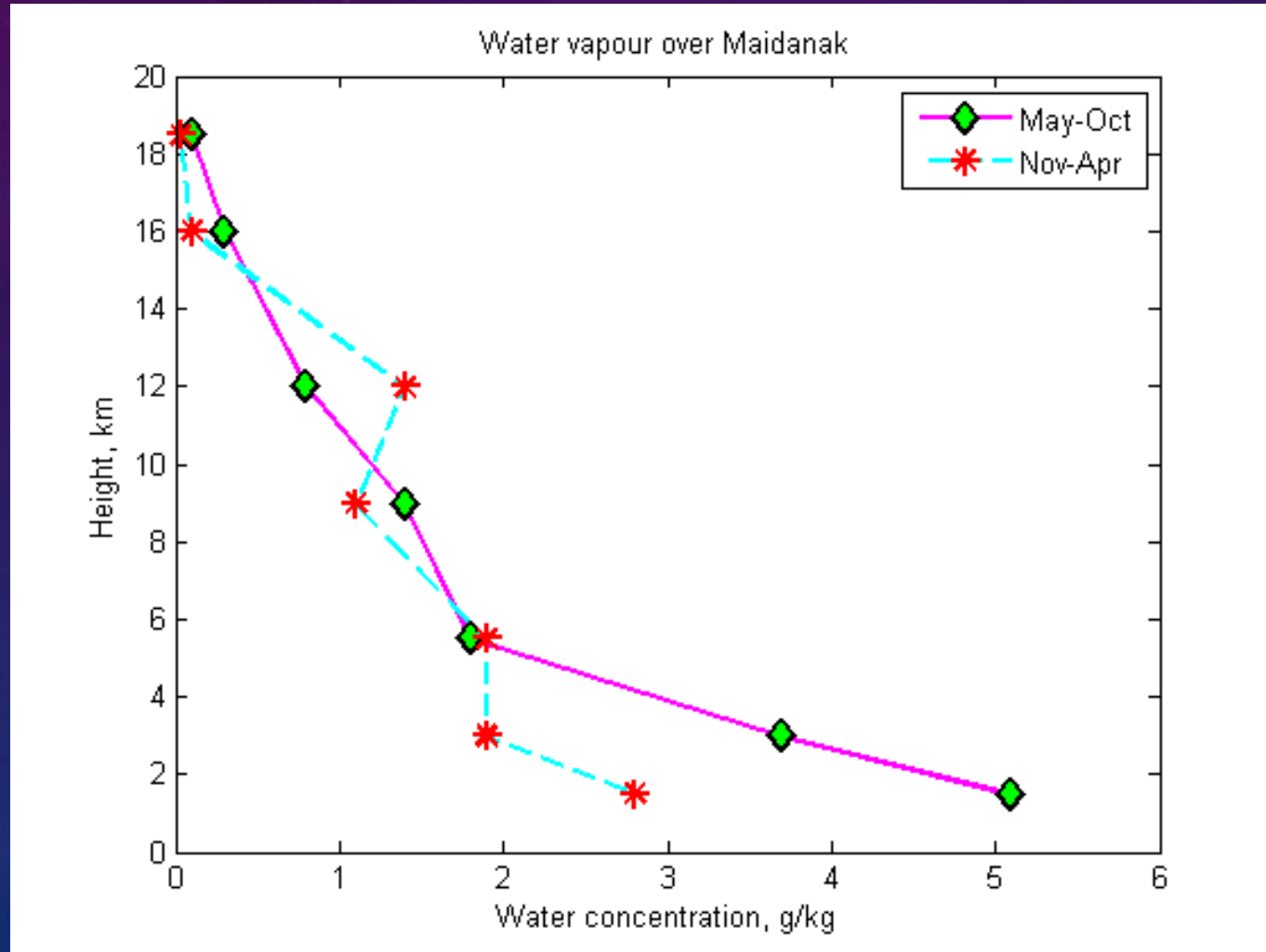
SURFACE LAYER WIND SPEED AND DIRECTION



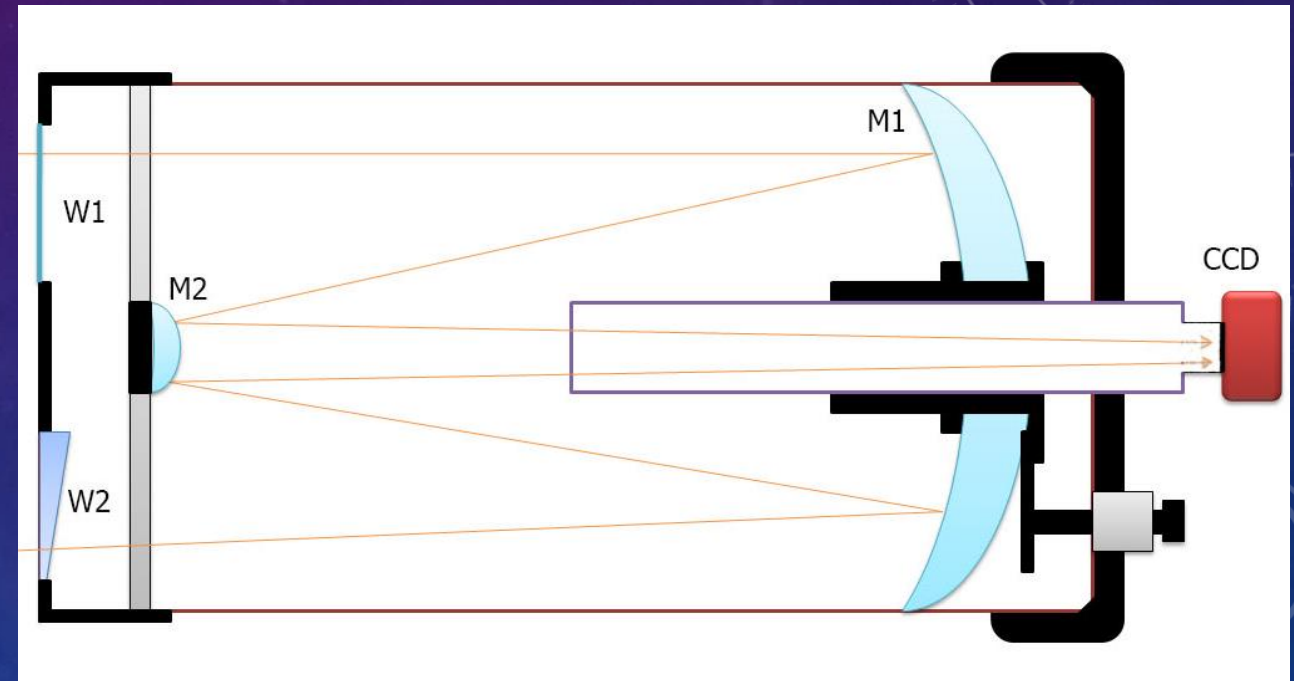
WIND PROFILE BY HYDROMET AEROLOGY DATA



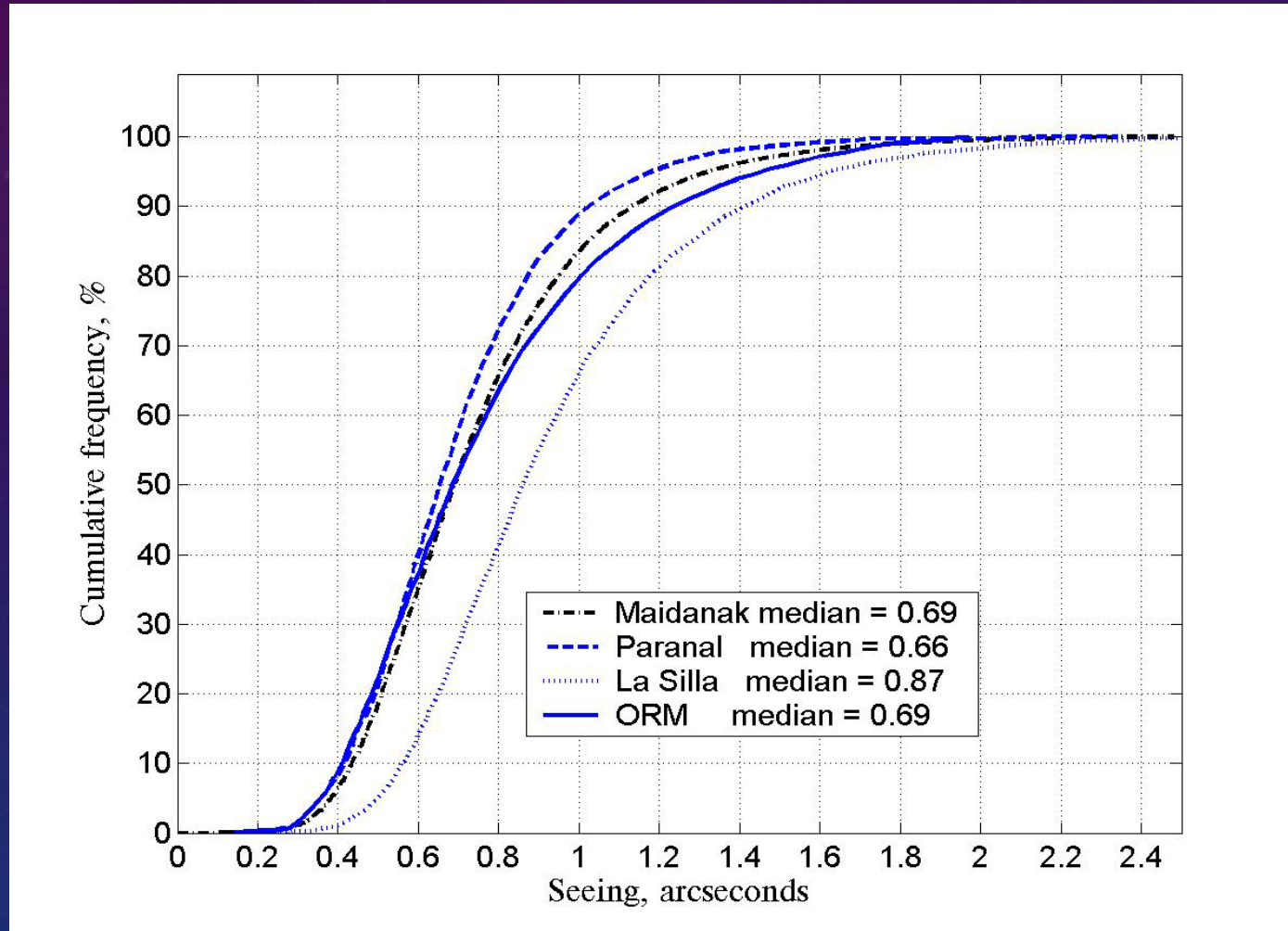
WATER CONCENTRATION OVER MAIDANAK



DIFFERENTIAL IMAGE MOTION MONITOR (DIMM)

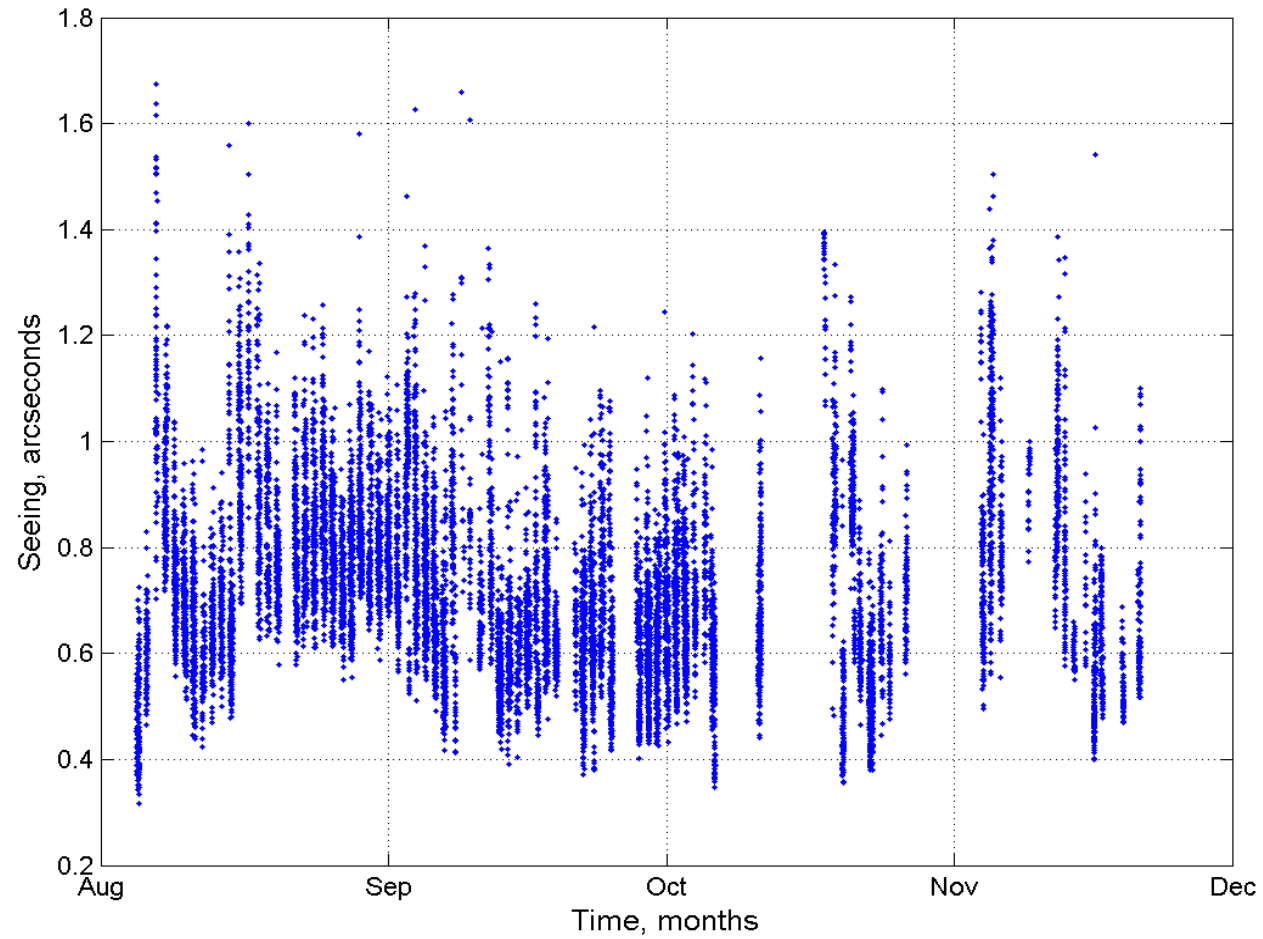


SEEING CONDITIONS AT MT. MAIDANAK



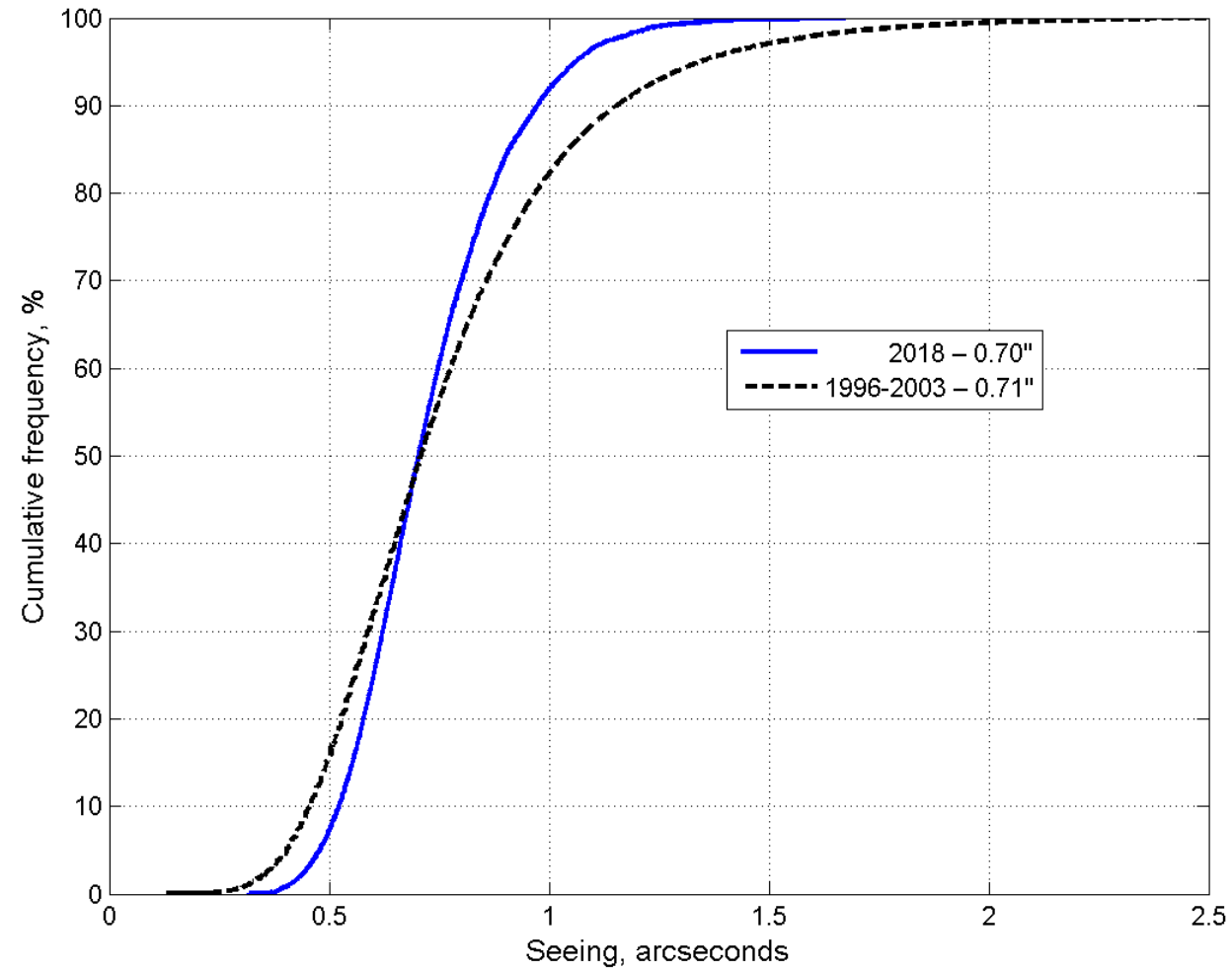
Ehgamberdiev et al, 2000 *Astron.Astrophys.Suppl.Ser.*, v. 145. p.293.

SEEING DATA OF 2018



Tillayev et al, 2021 submitted to MDPI Galaxy

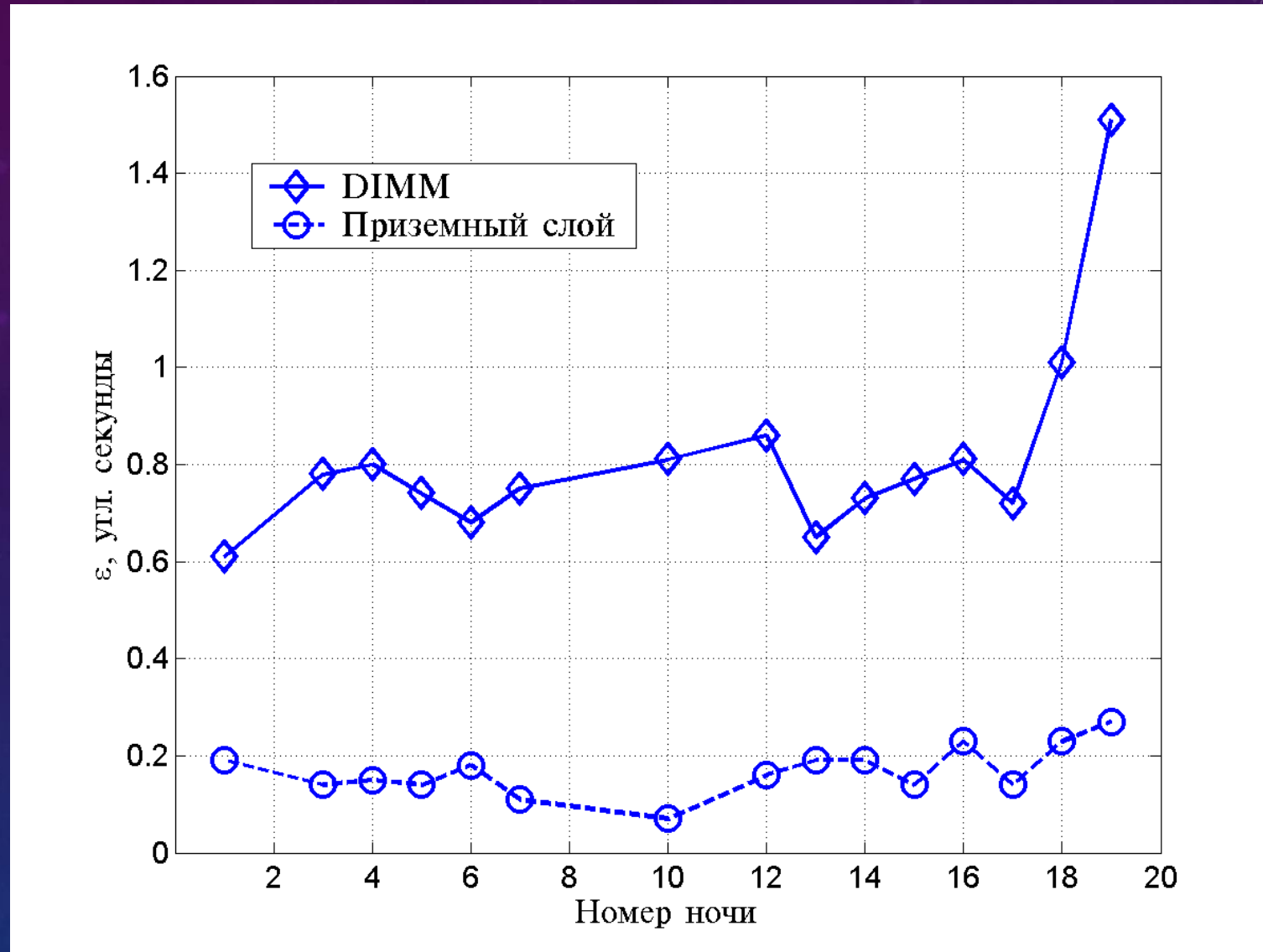
SEEING – DATA OF 2018



SEEING-DATA OF 2018

Months	1996-2003 (ϵ_{FWHM} , arcseconds)	2018 (ϵ_{FWHM} , arcseconds)	Difference
August	0.72	0.77	+0.05
September	0.70	0.66	-0.04
October	0.69	0.65	-0.03
November	0.65	0.75	+0.10
Total	0.71	0.70	-0.01

CONTRIBUTION OF THE SURFACE LAYER



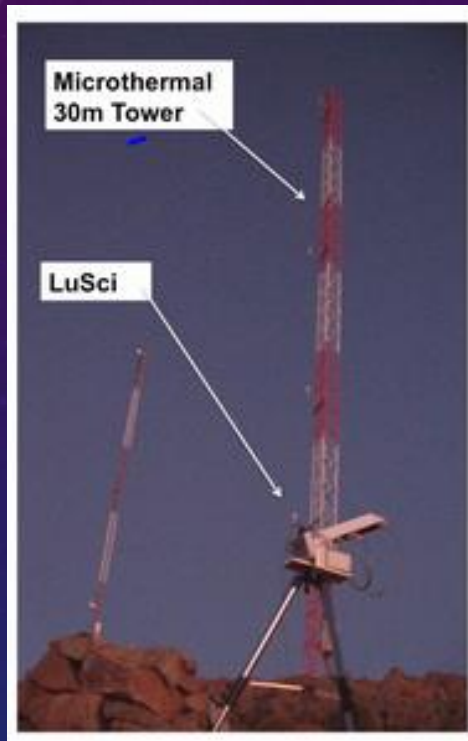
CHOOSING A PLACE – SURFACE LAYER TURBULENCE

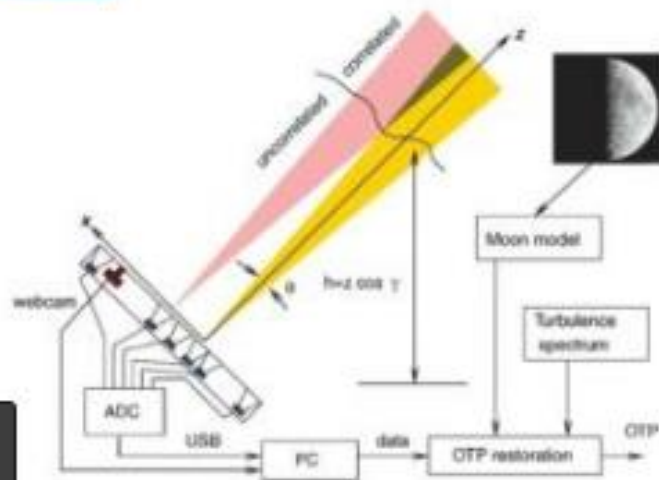


CANDIDATE SITES



LUSCI – ESO LUNAR SCINTILLOMETER



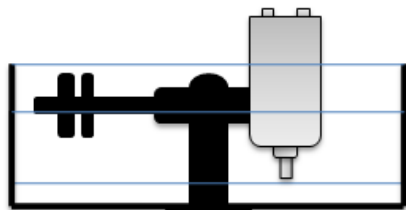


LUSCI CONSISTS OF A LINEAR ARRAY OF PHOTO-DETECTORS MEASURING THE FAST MOONLIGHT FLUCTUATIONS

THE OPTICAL TURBULENCE PROFILE IS DETERMINED BY USING MODELS OF THE TURBULENCE SPECTRUM AND OF THE LUNAR SHAPE (TOKOVININ ET AL. 2010). THE PROFILE IS RESTORED STARTING FROM FIXED PIVOT POINTS AT 3, 12, 48, 192 AND 768 M ABOVE THE INSTRUMENT.



DIMM_1

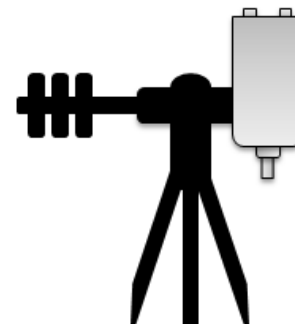


5 m

LuSci



DIMM_2



NEW UBAI-DIMM



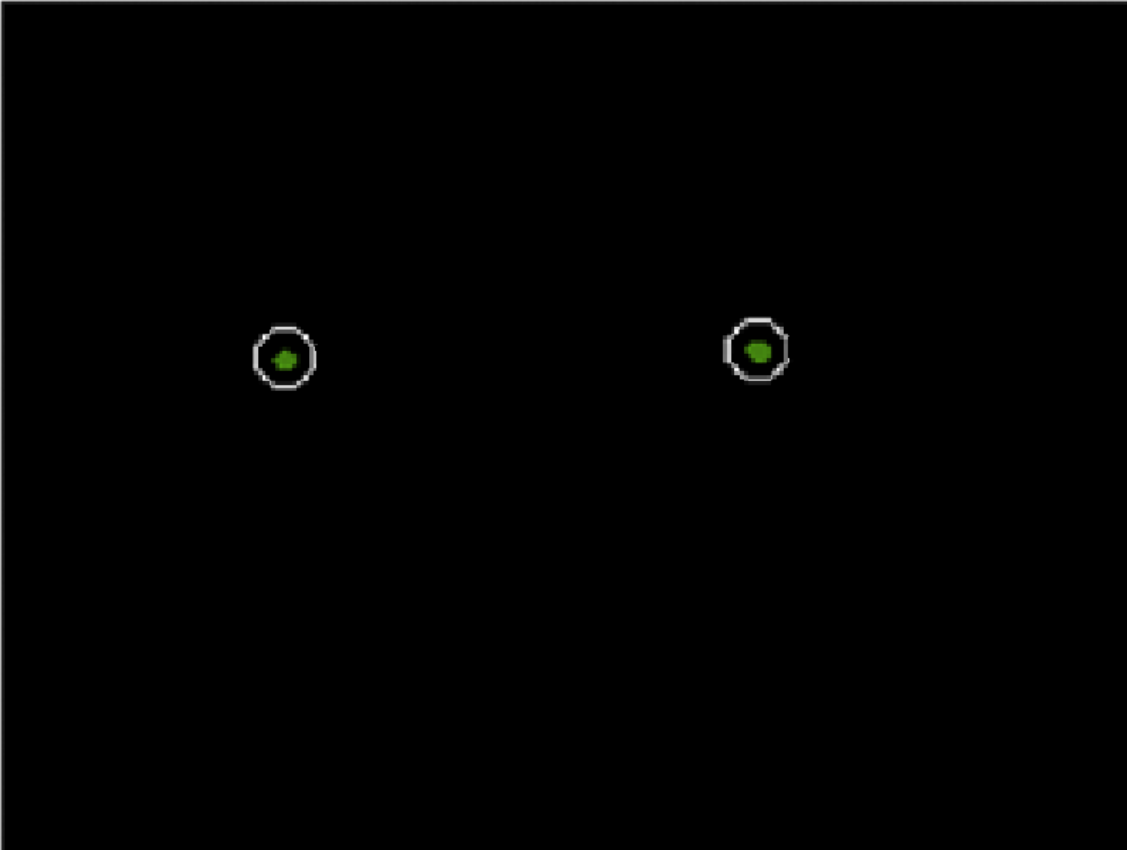
NEW DIMM SOFTWARE

DIMMY v0211

File Settings SOUND PLAY RESTART APPLICATION SaveIM1 picbox testGrab ExcelWrite LongTask TTT

MAIN WWW

Camera ▲ ON Camera ▼ OFF Start measurements Start focus mode Stop



INFO: (X,Y) = (639,279)

[CENTROID]

Flow1:= Flow2:=

CONTROLS

Nominal focus [Camera Controls]

85 Gain: 20.7 dB 20

Intensity thresh. 25

Min window size Exp.: 2 ms 2

Wind. size: (Thr) 40

Pause: 2

INFO :

280/500 Width = Height =

0 % Mean = Std. =

MEASUREMENT INFO 2X StD+M =

[MEASUREMENTS]

Star Name: StarName Start Time:

Measurements: 500 Current Time:

Total Seconds:

Error Wait : 600 ☒ Cheksiz

[OUTPUT IMAGE]

[Original Image] [Centroid Image]

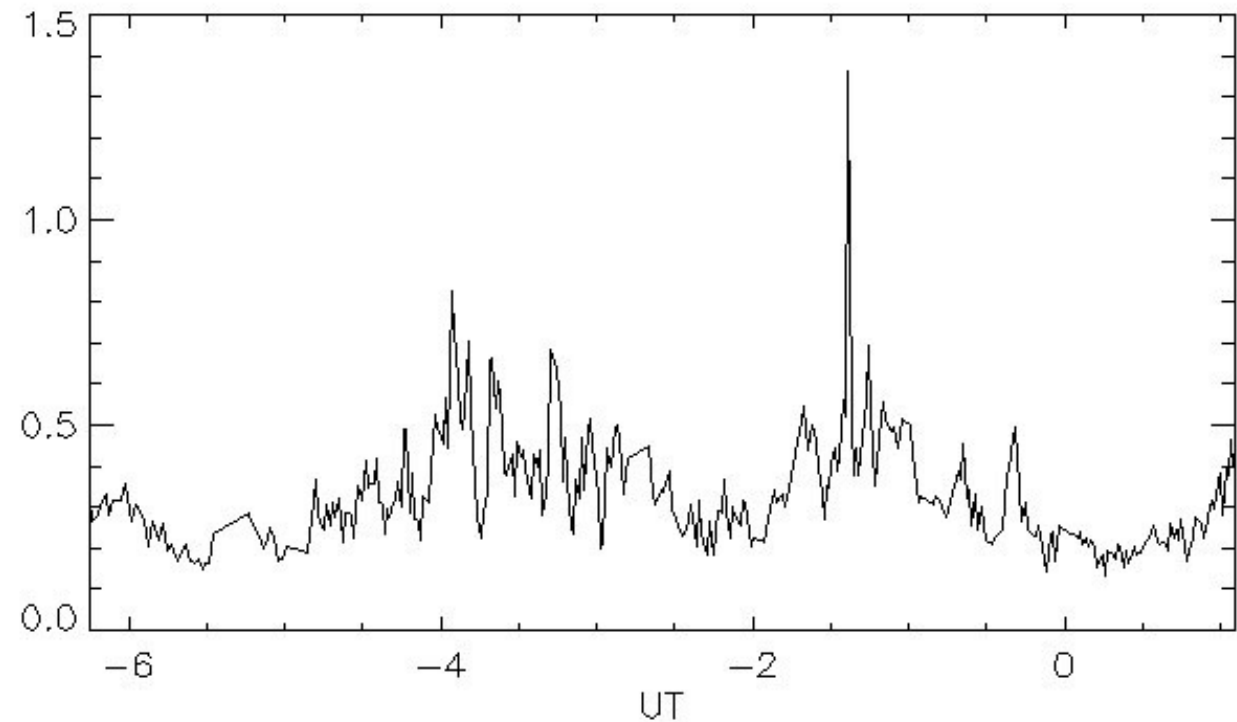
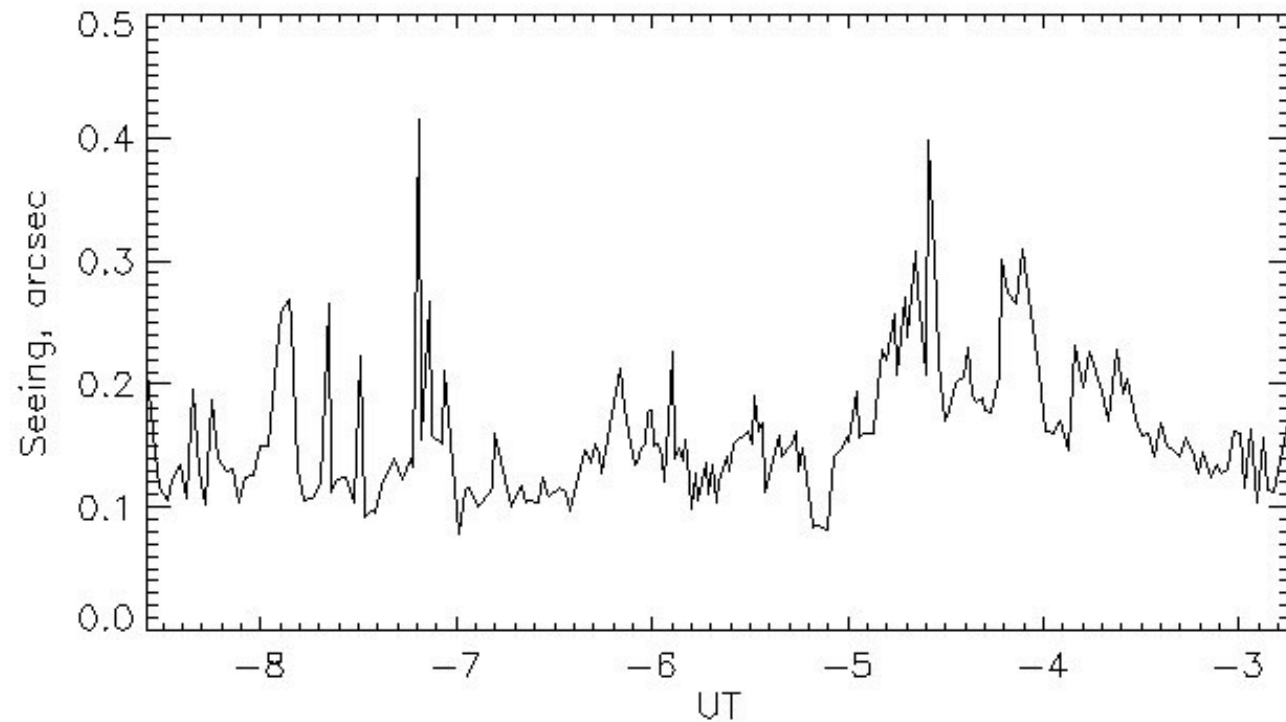
☐ Auto Save Original Image ☐ Auto Centroid Image

☒ Save Every: 10 ☒ Save Every: 10





EXAMPLES OF SURFACE LAYER TURBULENCE SEEING

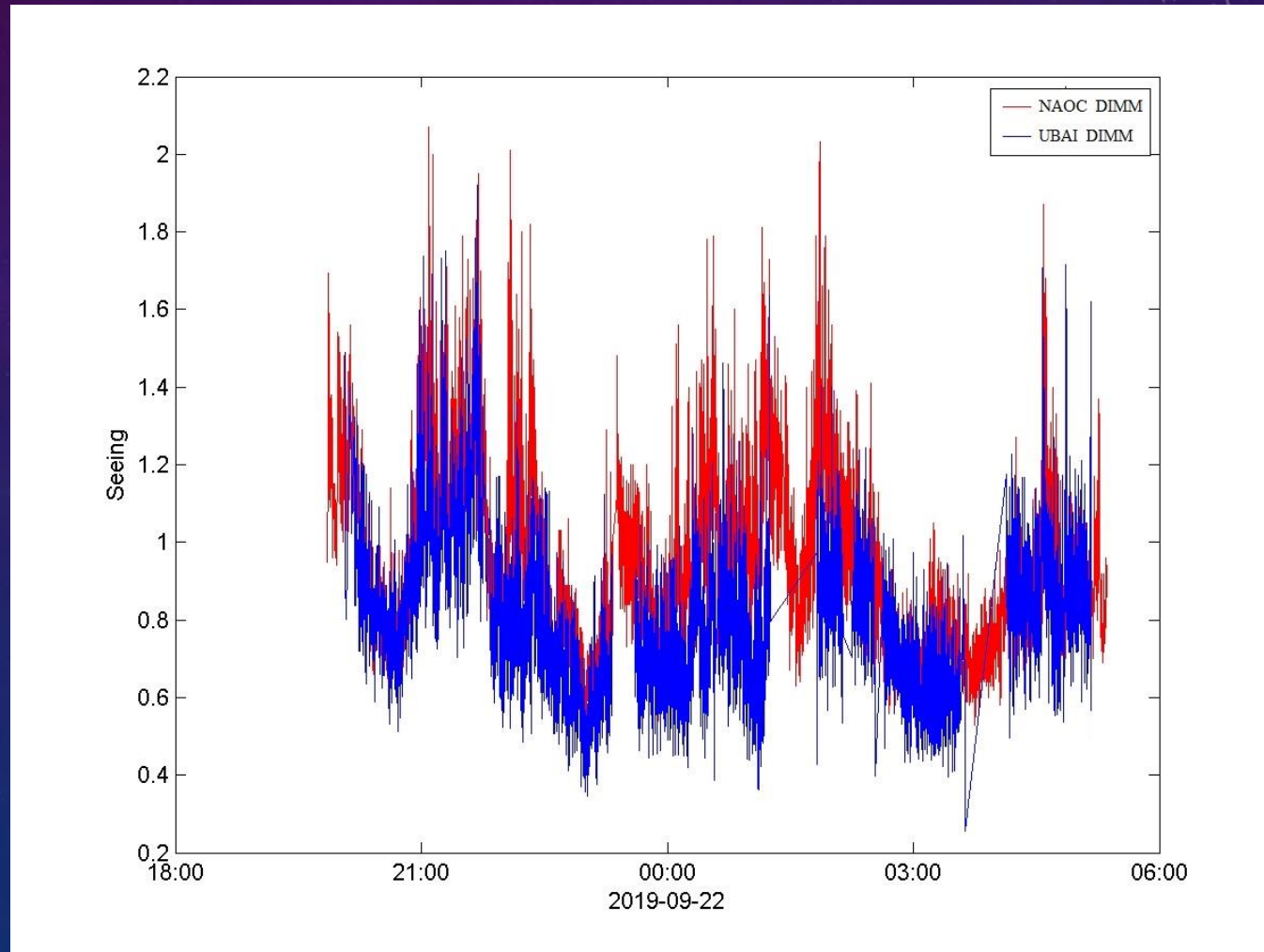


UBAI-DIMM AND NAOC-DIMM AT 6M PLATFORM

- End of 2019 observations for intercalibration
- 62 nights of synchronous measurements in 2019
- 117 nights of measurements in 2020

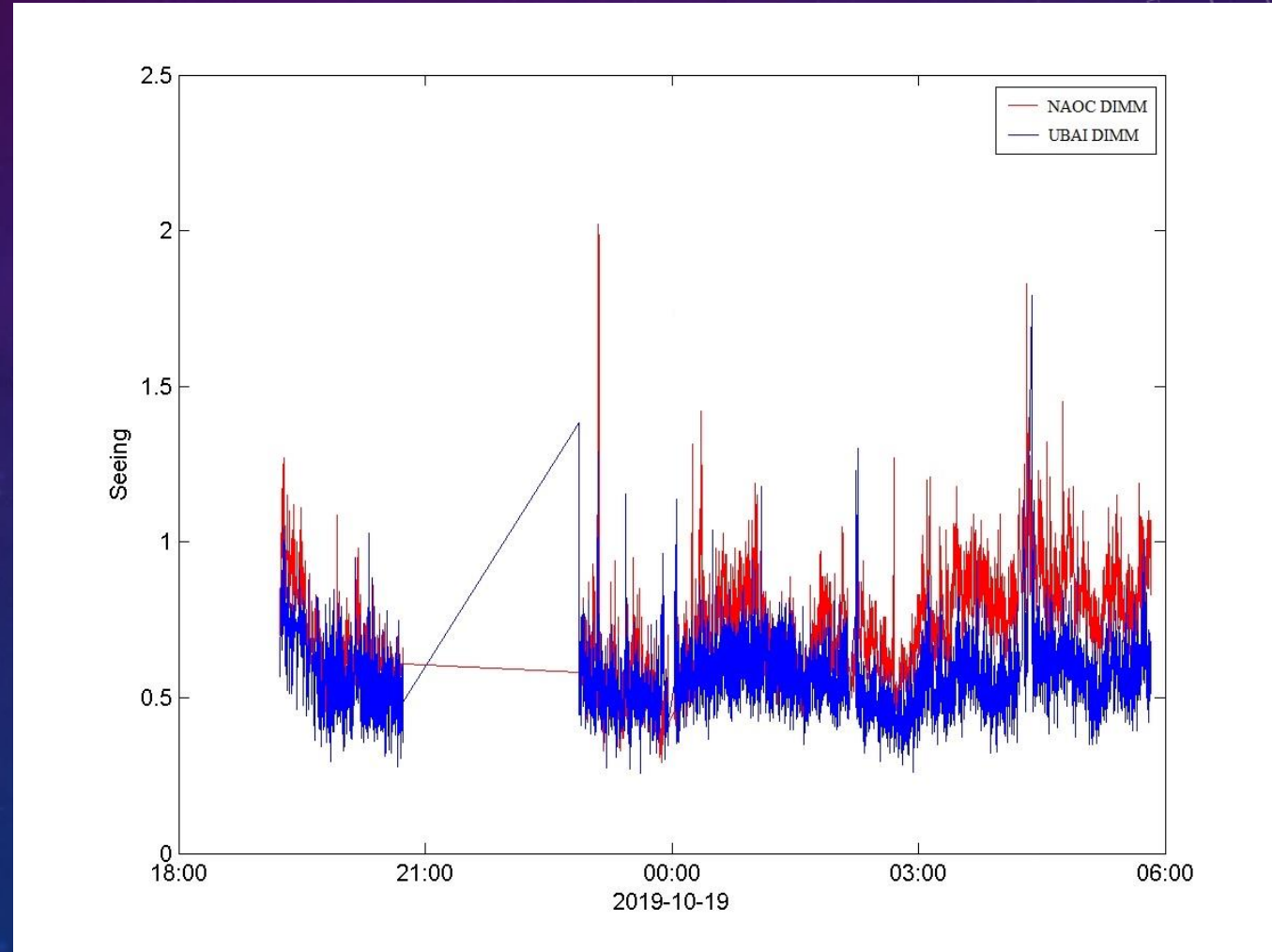


UBAI-DIMM AND NAOC-DIMM



UBAI-DIMM AND NAOC-DIMM

- The data are being processed for a joint publication





2021/10/29 10:04





CONCLUSION

- We started new measurements of site testing parameters
- Seeing, surface layer turbulence, meteorology etc
- Intercalibration UBAI-DIMM – NAOC-DIMM is under process
- Continue seeing measurements on 11-m-high platforms