From clear skies to publication
Observing strategies and LBT productivity

C. Veillet

LBTO

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Observing strategies and LBT productivity

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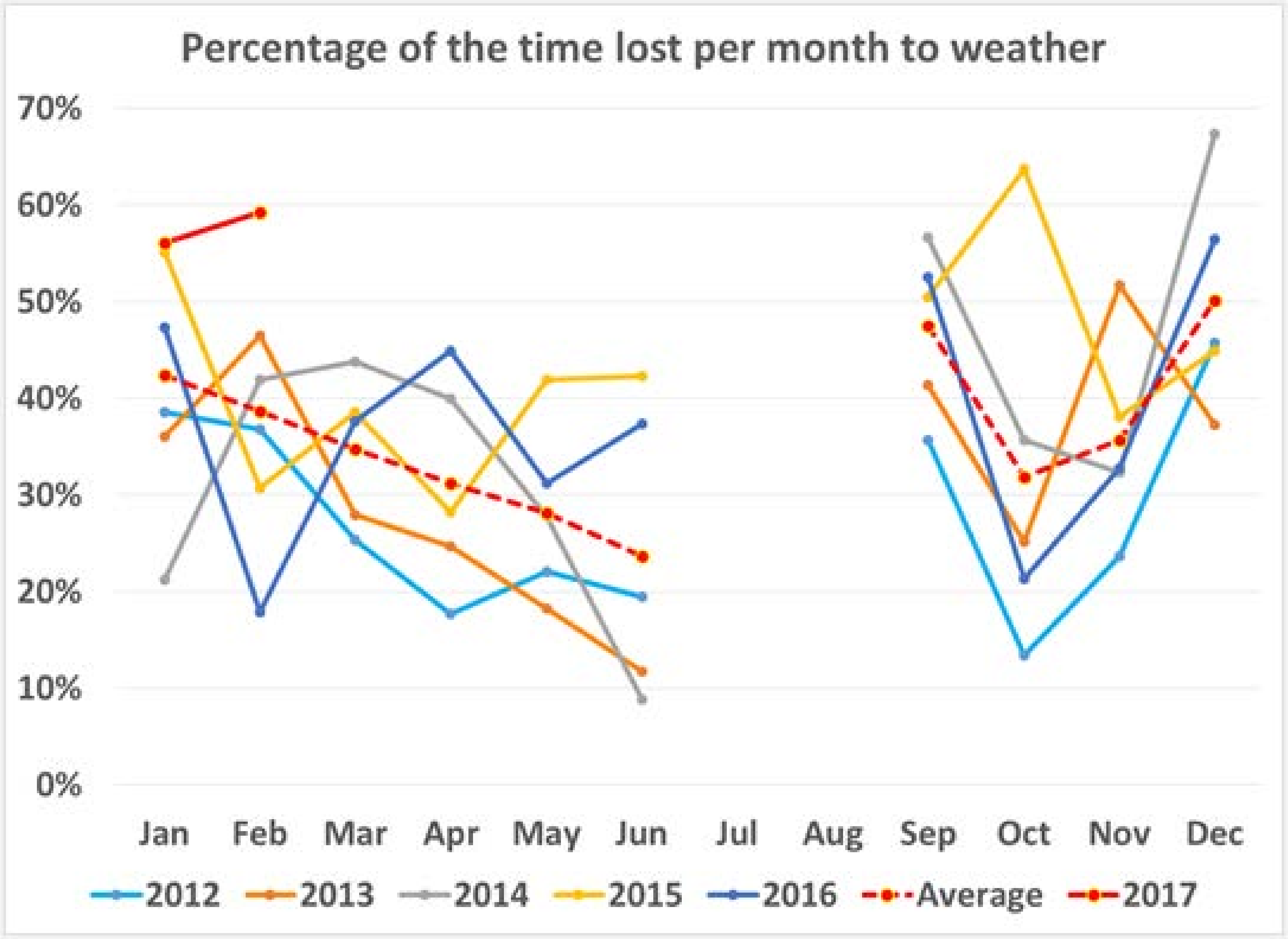
The site (weather – seeing)

Observing time (comparing LBTO to a 8m-class telescope)

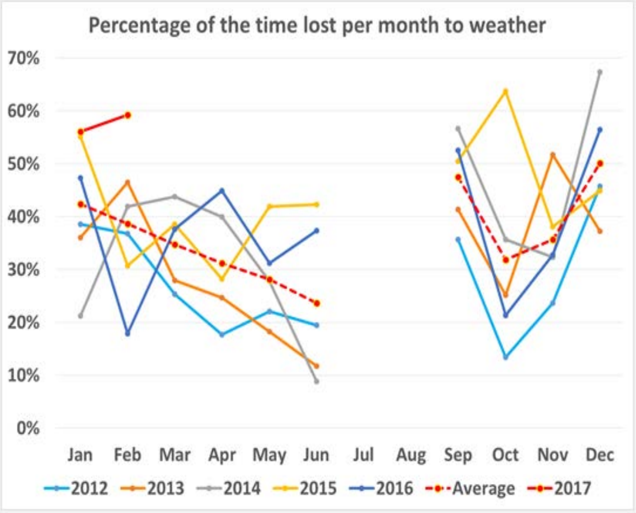
Publications (could we have more?)

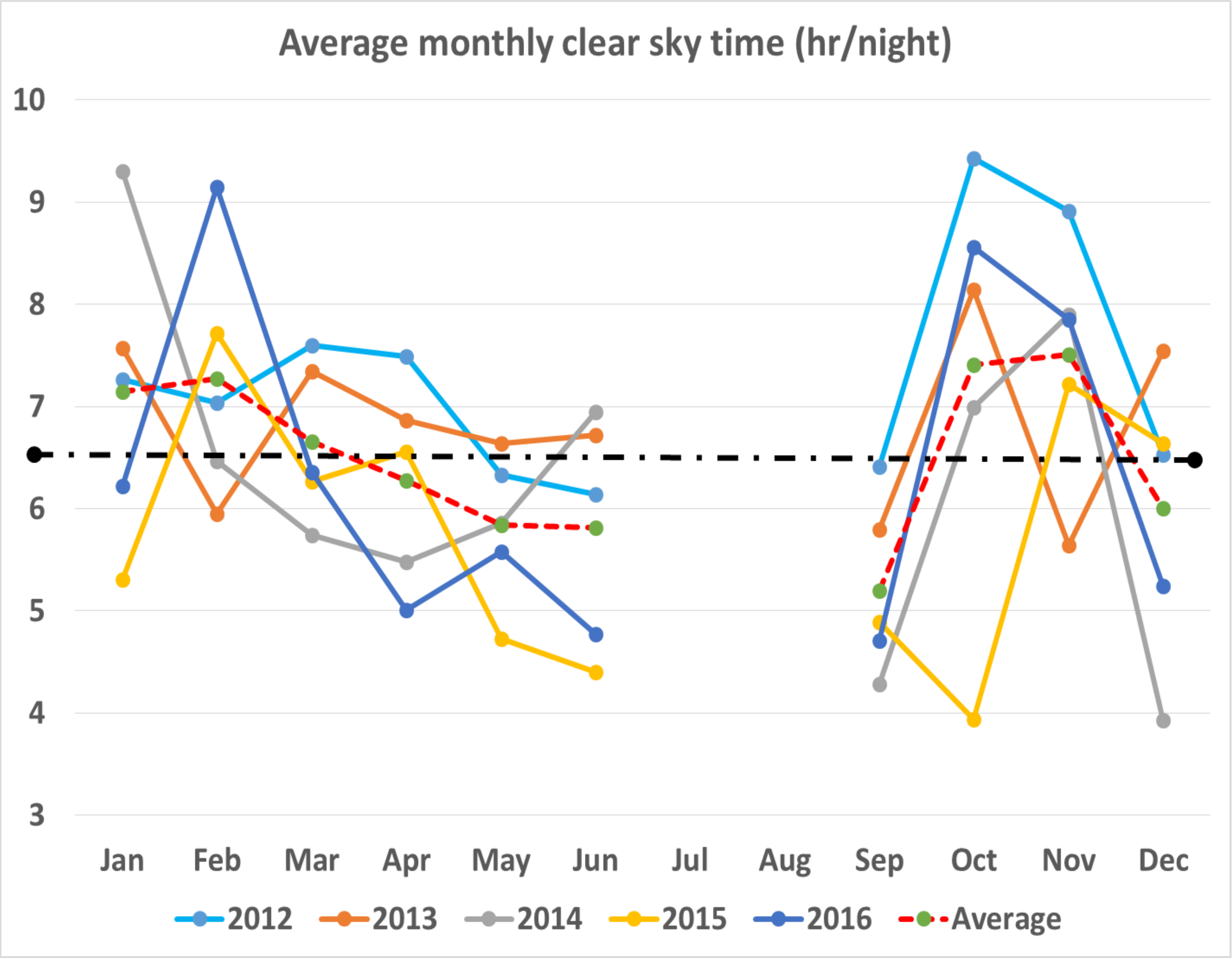
LBTO

Weather



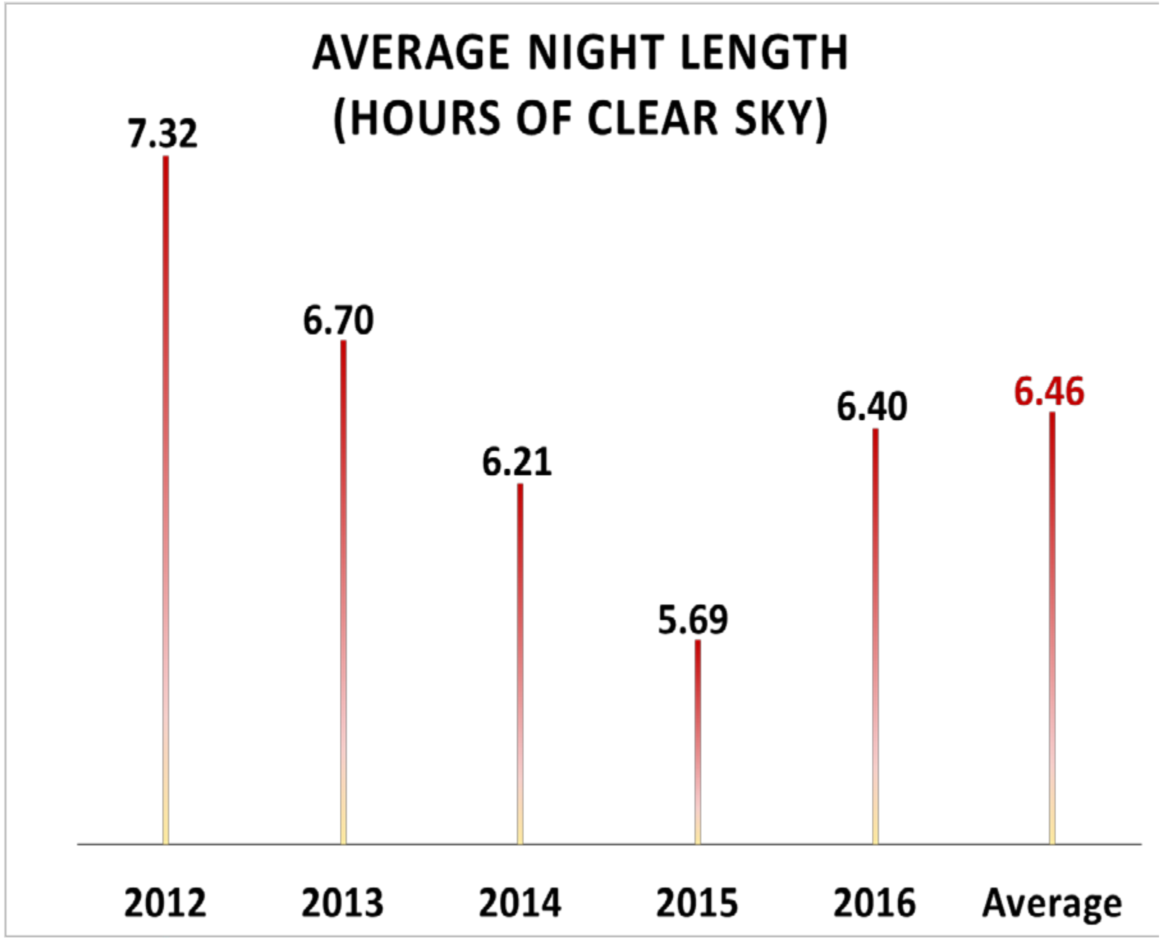
Percentage of the time lost per month to weather
70%
60%
50%
40%
30%
20%
10%
0%
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2012
2013
2014
2015
2016
Average
2017

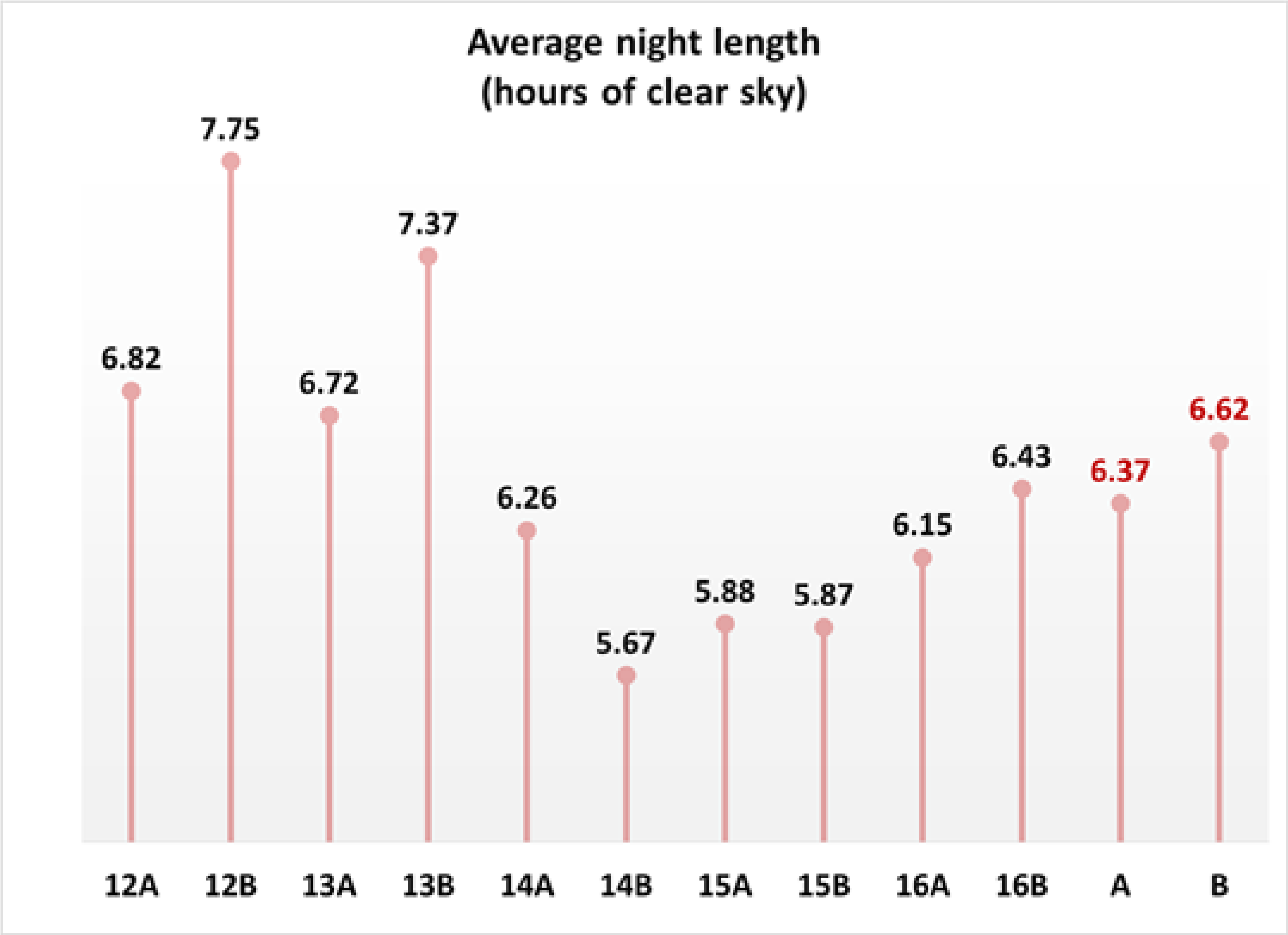




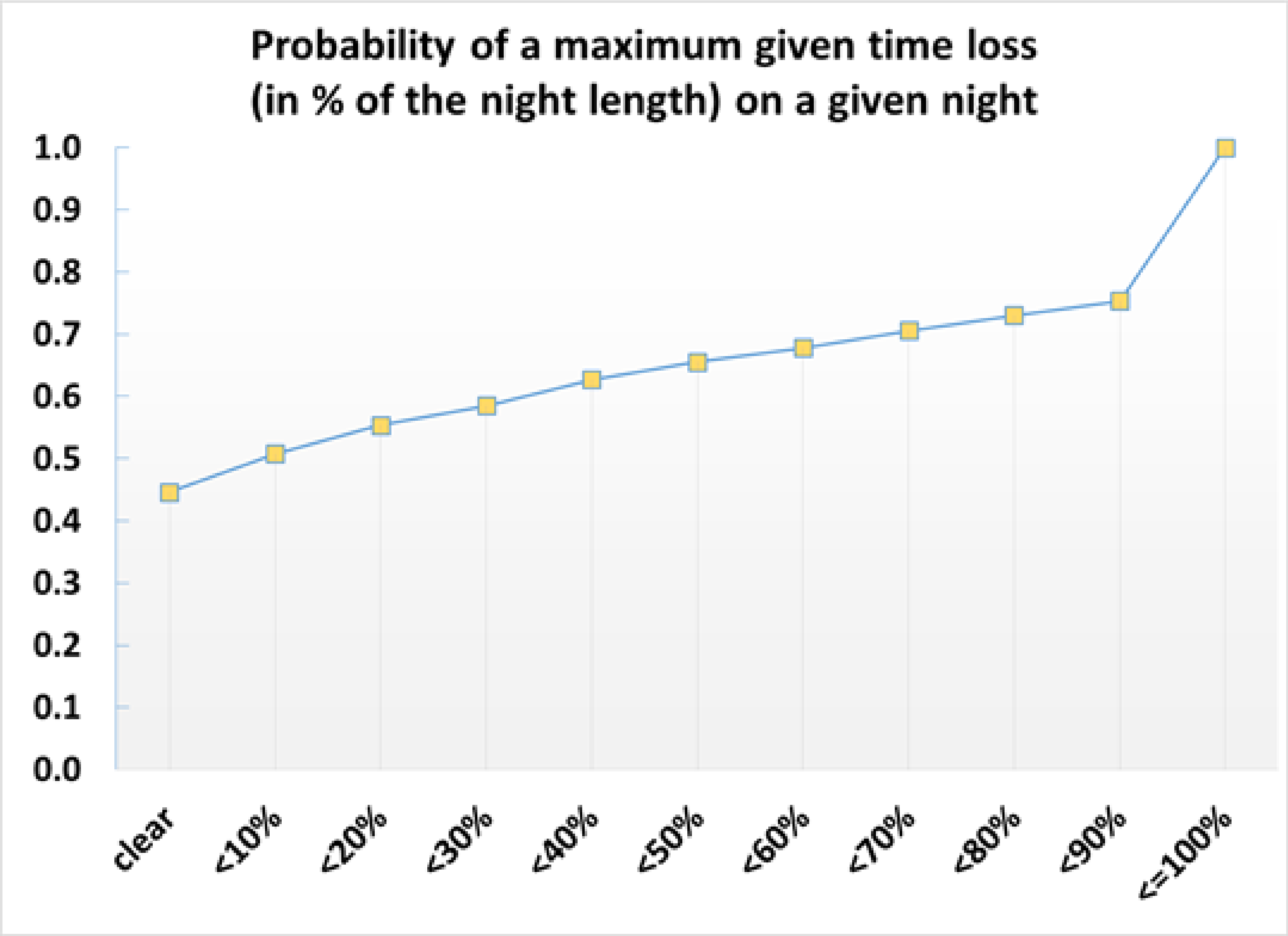
If allocations are in nights, it is still better to be scheduled in winter (but not in December…)

Beware of statistics…

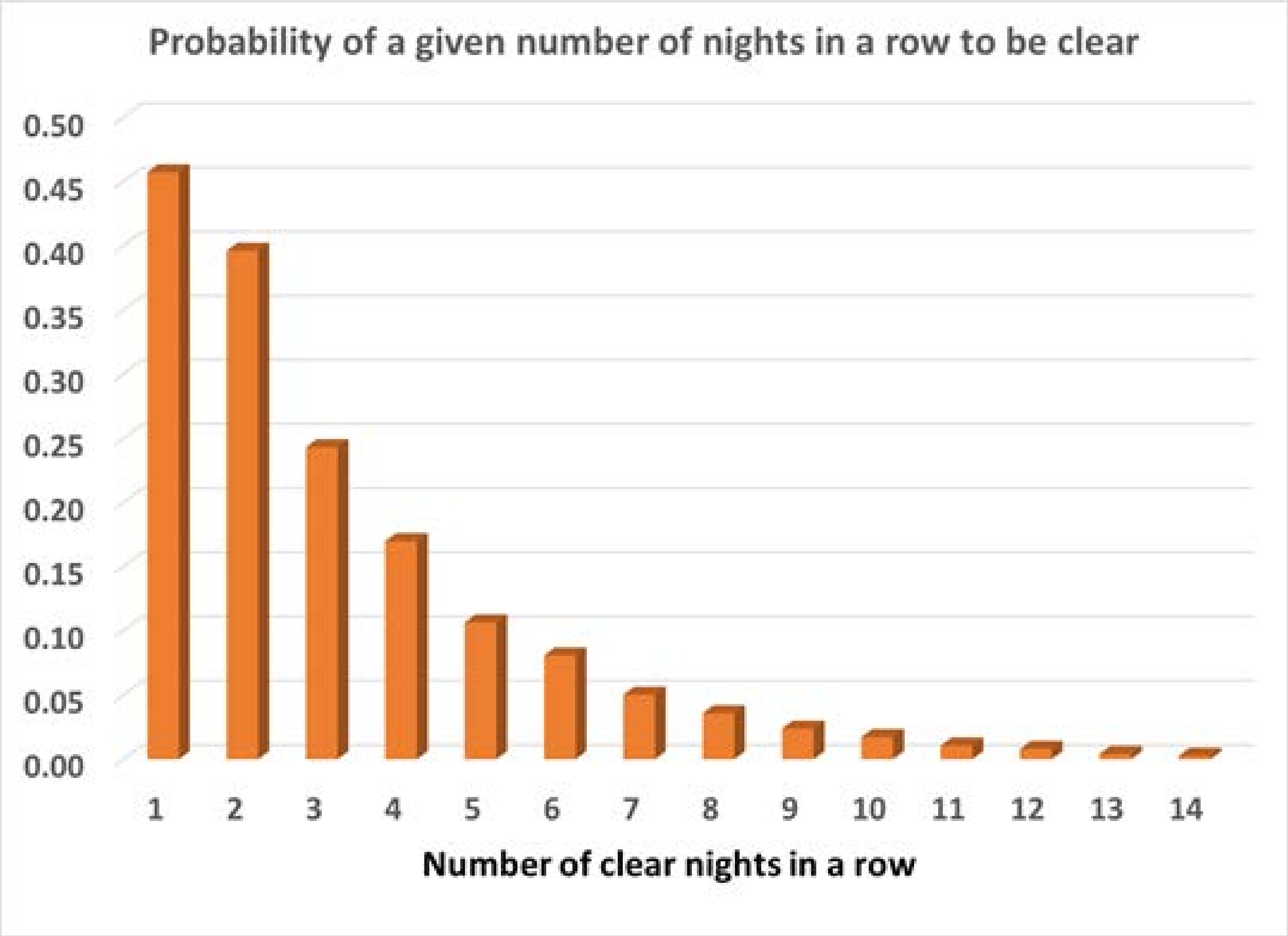


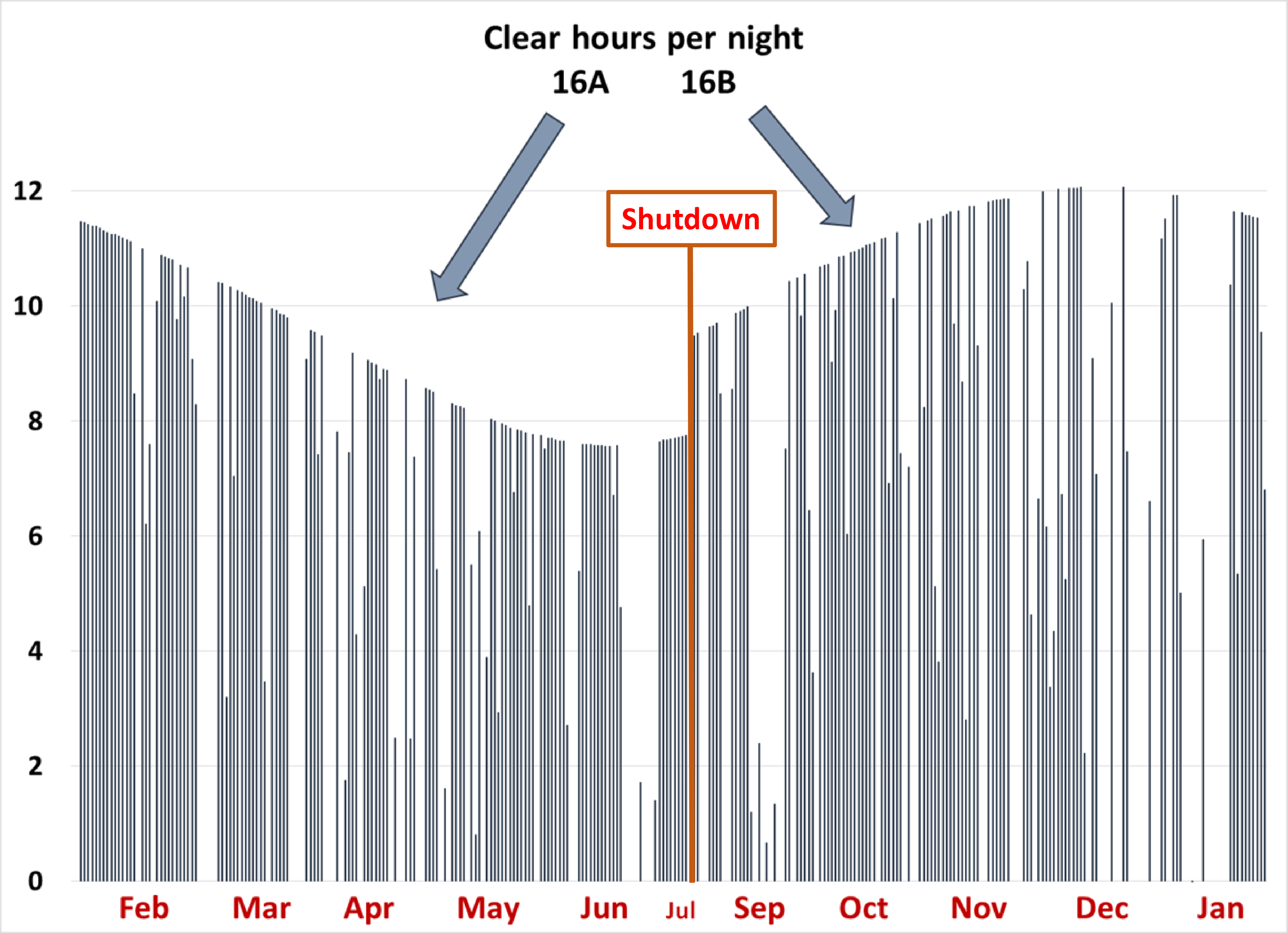


There is less than 50% chance to have a given night completely clear



There is less than 50% chance to have a given night clear




Clear hours per night
16A
16B
Shutdown
12
10
8
6
4
2
0
Feb
Mar
Apr
May
Jun
Jul
Sep
Oct
Nov
Dec
Jan

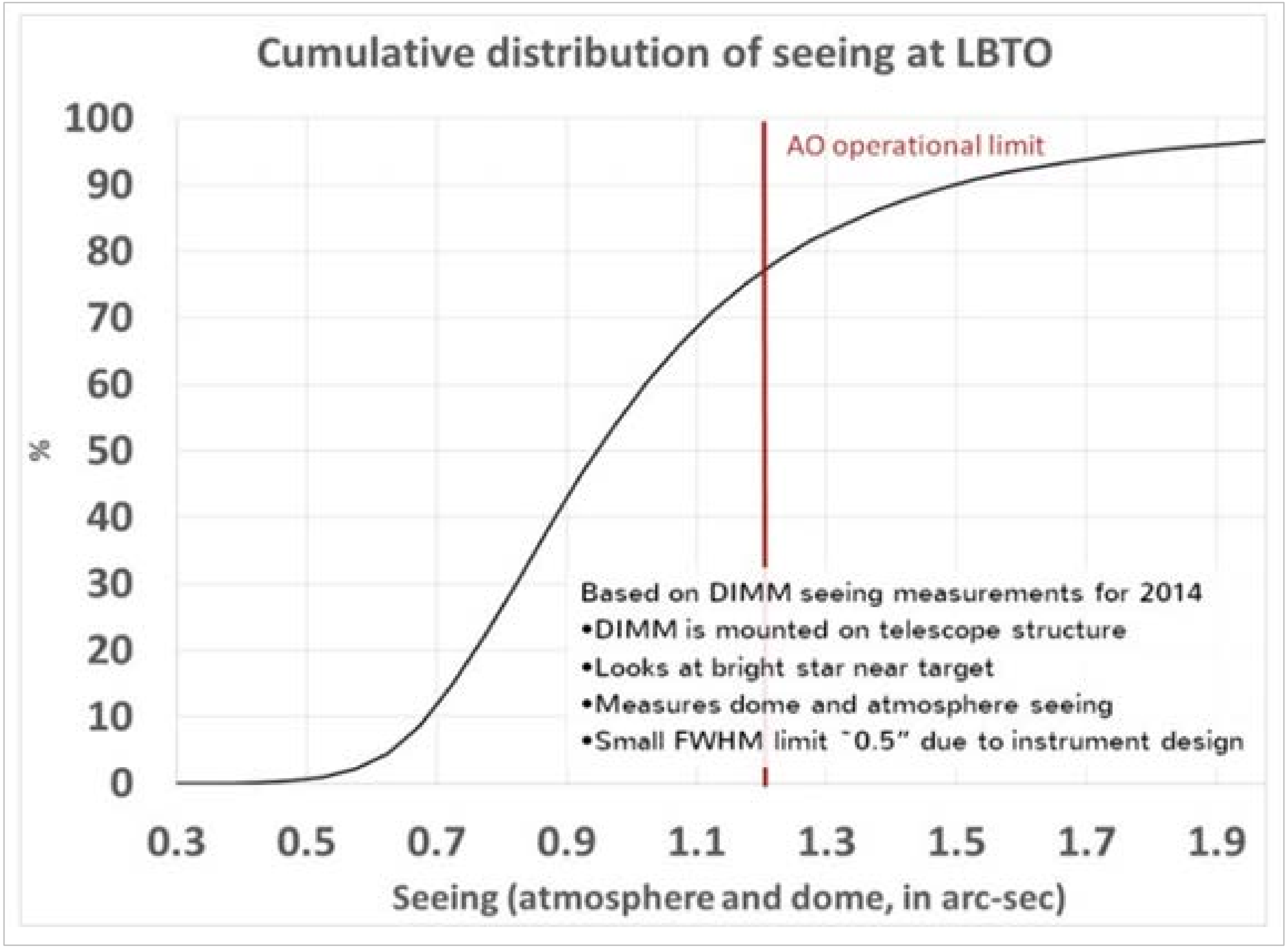
Seeing

A touchy issue!

Better statistics needed

(talks on ALTA)

MASS (ARGOS) will complement DIMM data



Science Time

How does LBTO compare with other 8m class telescopes

Science Time per year (lately)

- 65 day closure (summer shutdown and restart - Jul 10/Sep 12) + 75 commissioning and engineering night (35 ARGOS, 15 LUCI, 10 LN, 5 PEPSI, 10 E)

225 nights for science (75% of the open time)

- At other observatories, 30 to 45 nights of closure and E time. If no commissioning, **320 to 335 nights a year**.

LBTO/others: 70%

Science Time per year (soon)

- Around 30 nights a year for commissioning SOUL-SHARK-iLocater + 10 E (LUCI-PEPSI-ARGOS-LN done)

260 nights for science (90% of the open time)

LBTO/others: 85%

Weather

- From the statistics over the past year, the average length of a night is **6.5hr** instead of **10.4**, if every night was clear outside of the summer closure.
- In average, **we observe only 62% of the time**.
- At good sites like on **Maunakea or in Chile**, there is in average a 15 to 20% loss to weather, which means observing for **80 to 85% or the time**.

LBTO/others: 75%

Technical losses

- In average over the past eight semesters: **7.5%** of the open shutter time
- At Gemini, the average of Gemini North and South was 6.8%.
- Let us take **5%**, which is probably an average between **ESO and Gemini** as a reference.
- We end up with a hit of **97%** compared to the other telescopes.

LBTO/others: 97%

Overall comparison

Observing time ratio LBTO/ESO-Gemini					
	Number of nights	**Technical Losses**	**Weather**	**Binocular Gain**	**Total**
So far	70%	97%	75%	115%	**59%**
Soon	85%	97%	75%	185%	**114%**

- **Not taken into account:**
  - Global seeing distribution (better statistics - ESM, ARGOS and LUCI AO will help)
  - Nightly seeing variability (important for programs needing good seeing over a long period of time, such as a transit)

Some comments on the current scheduling

- Telescope, instruments, or AdSec issues can have a high impact on a given run.
- Rigidly scheduled commissioning leads to important delays.
- Some limitation of current mini-queues and classical scheduling

  At times sub-quality data as less time is available to wait for the right conditions, missed time constrained observations as less nights to choose from, at times less trained observers, …

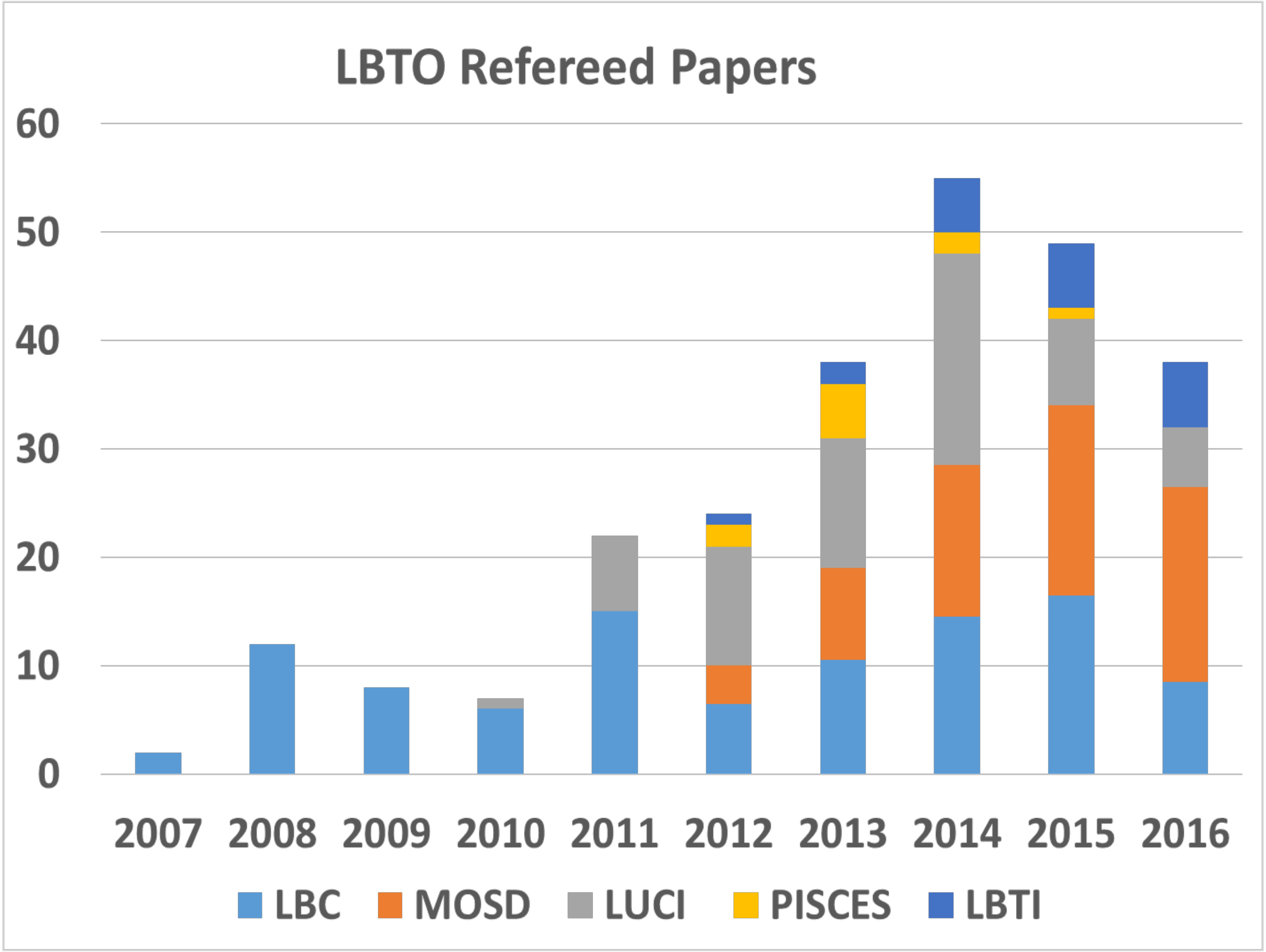
A few more…

- **Currently, allocations in nights**: one night is 10hr in average
- Bad for small allocations aka PEPSI or classical AZ time.
- Not as bad with mini-queues as it averages over a few years but a semester can be really bad for a partner compared to the average of that semester.
- **Time should be allocated in hours**, which is impossible in the current system (scheduling nightmare…)

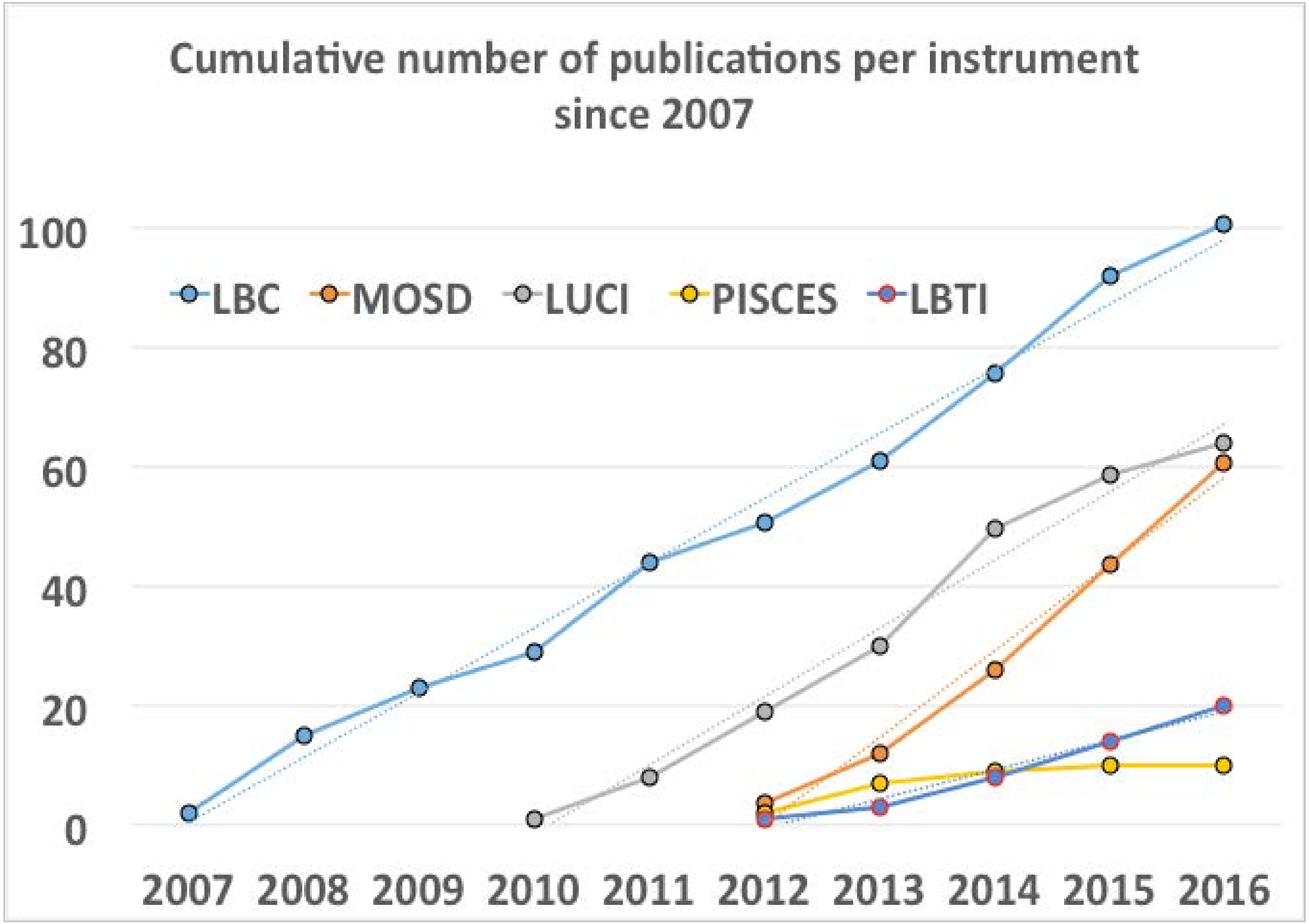
(will be solved once in an LBT-wide Queue)

Same comments for the impact of bad weather

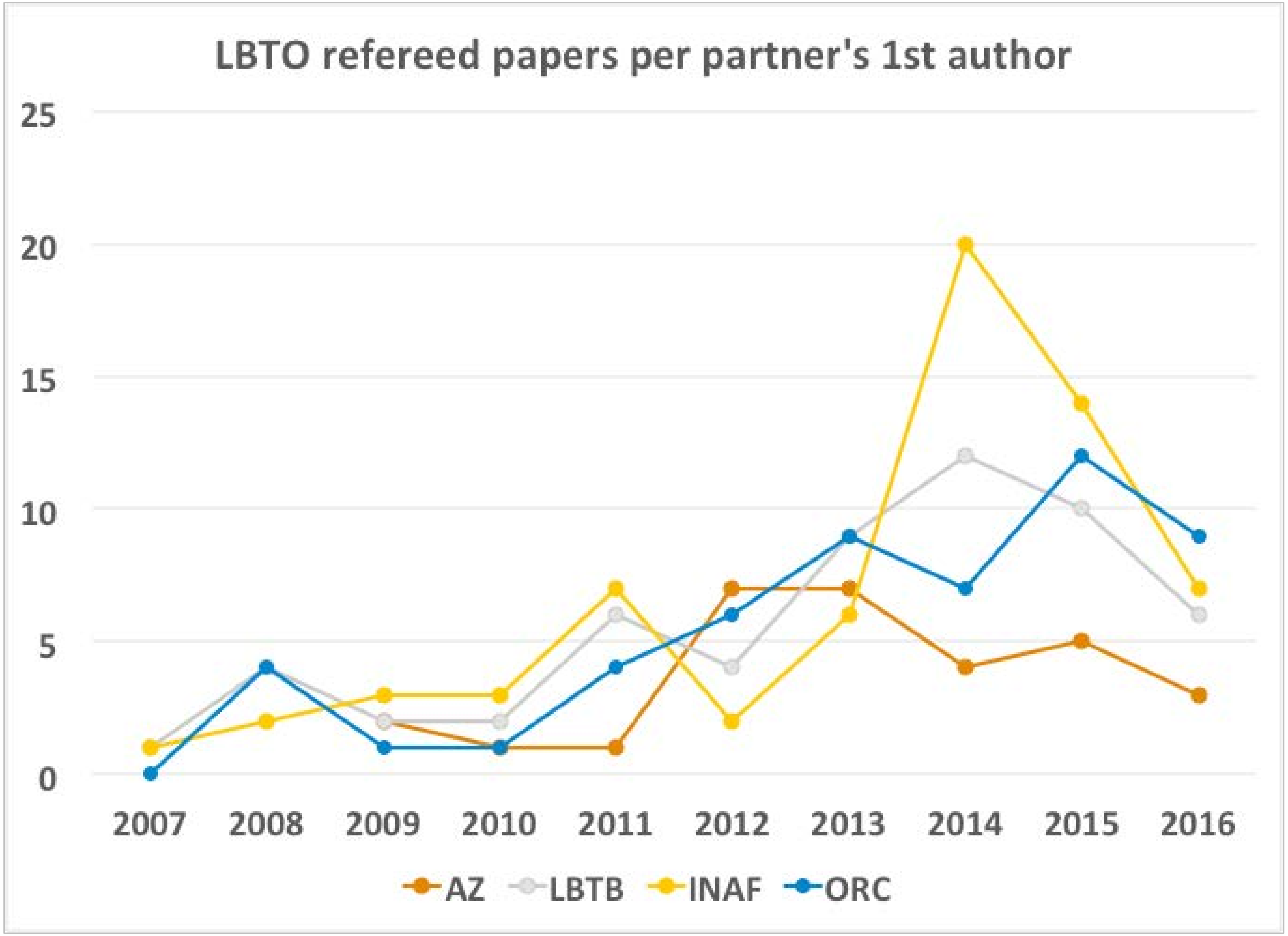
Publications



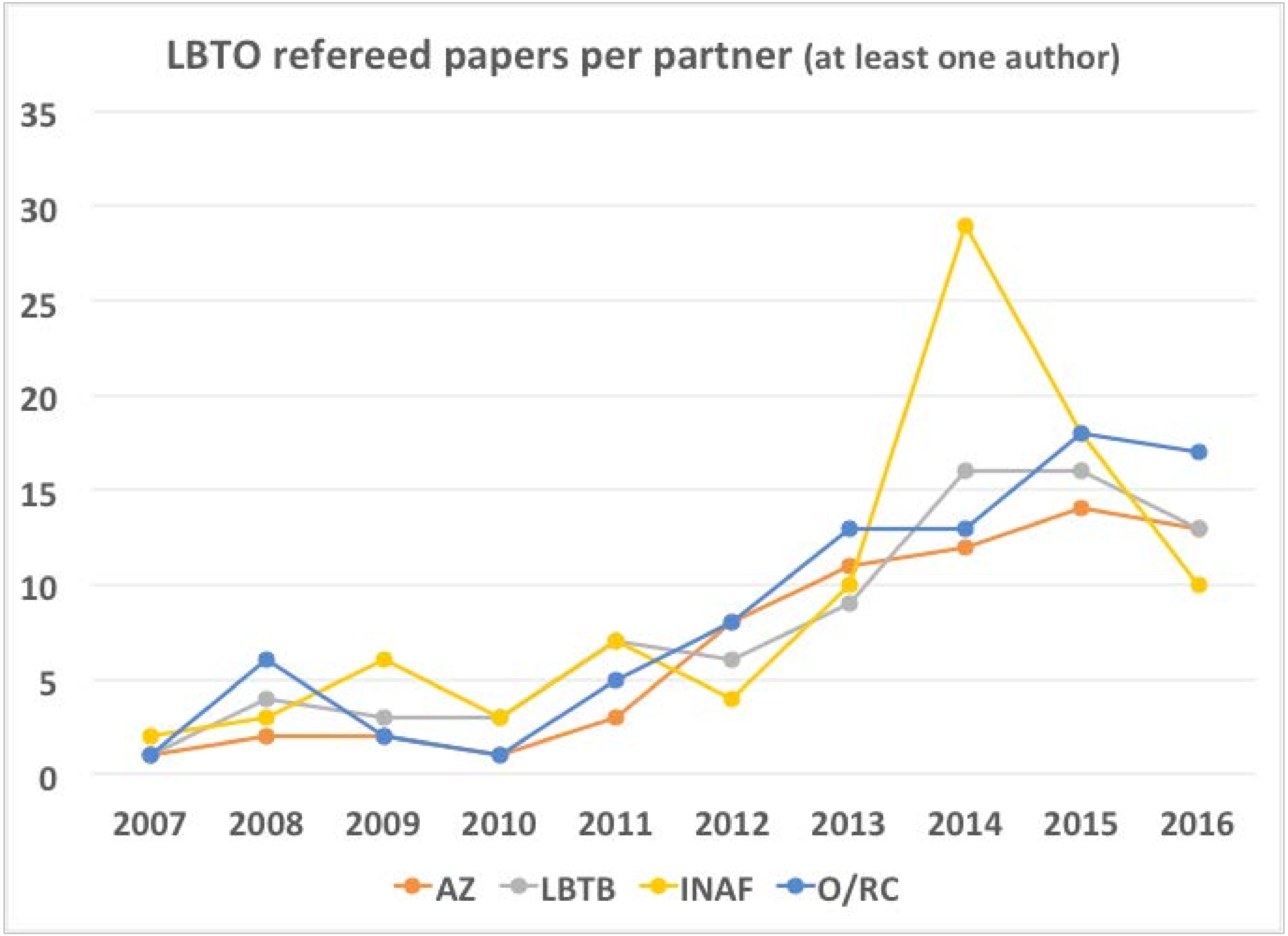
Publications



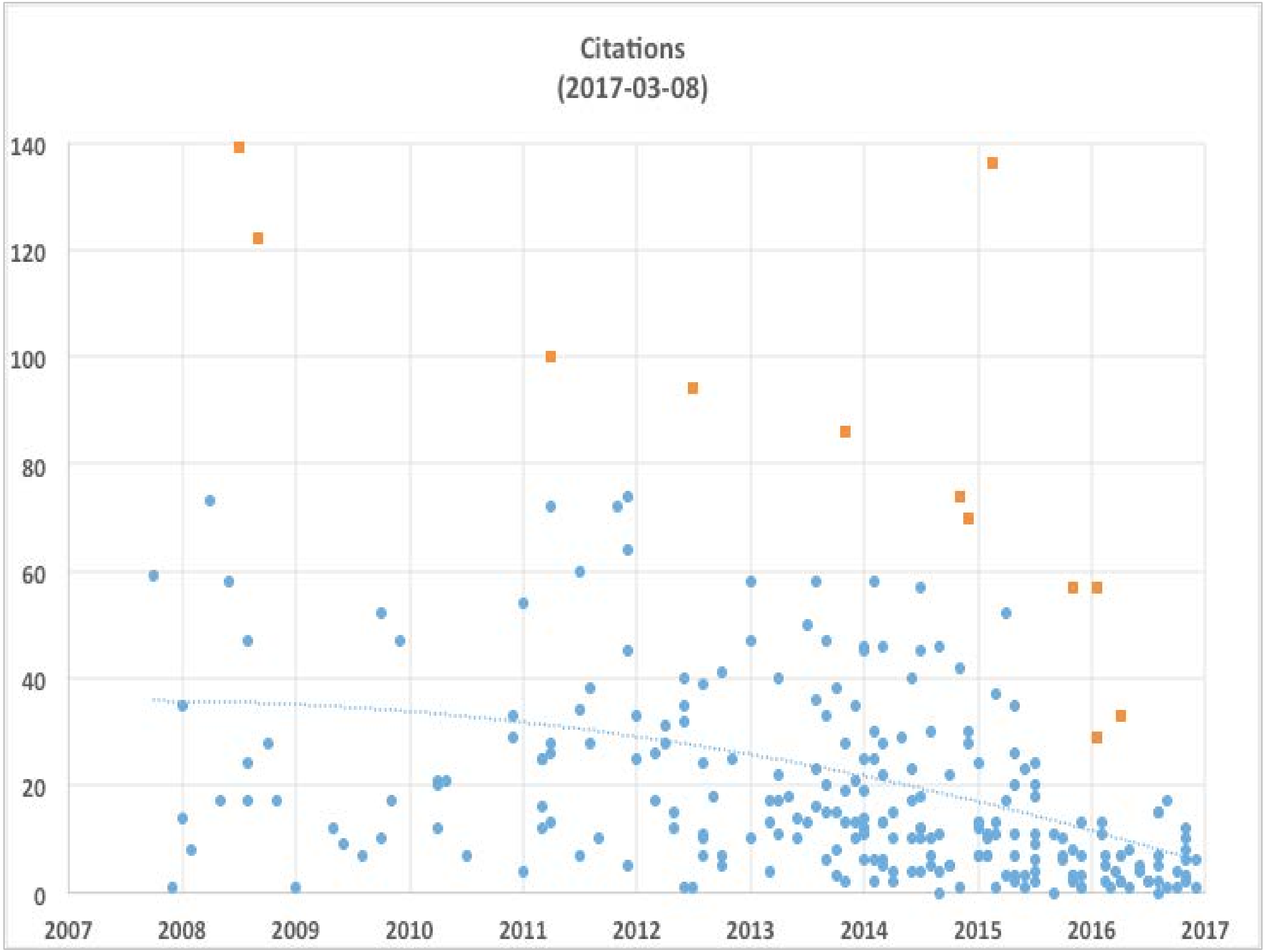
Publications



Publications



Publications



Authors	Title	Journal	instrument	data year	Web	Month	Citations (2017-03-08)
Fausnaugh M. M., Denney K. D., Barth A. J., et al.	Space Telescope and Optical Reverberation Mapping Project. III. Optical Continuum Emission and Broadband Time Delays in NGC 5548	ApJ	MODS	2014	http://adsabs.harvard.edu/abs/2016ApJ...821...56F	Apr-16	33
Grazian A., Giallongo E., Gerbasi R., et al.	The Lyman continuum escape fraction of galaxies at z = 3.3 in the VUDS-LBC/COSMOS field	A&A	LBC	2010	http://adsabs.harvard.edu/abs/2016A%26A...585A..48G	Jan-16	29
Holoien T. W.-S., Kochanek C. S., Prieto J. L., et al.	Six months of multiwavelength follow-up of the tidal disruption candidate ASASSN-14li and implied TDE rates from ASAS-SN	MNRAS	MODS	2015	http://adsabs.harvard.edu/abs/2016MNRAS.455.2918H	Jan-16	57
Sallum S., Follette K. B., Eisner J. A., et al.	Accreting protoplanets in the LkCa 15 transition disk	Nature	LBTI	2014 2015	http://adsabs.harvard.edu/abs/2015Natur.527..342S	Nov-15	57
Wu X-B, Wang F., Fan, X. et al.	An ultraluminous quasar with a twelve-billion-solar-mass black hole at redshift 6.30	Nature	MODS LUCI	2014	http://adsabs.harvard.edu/abs/2015Natur.518..512W	Feb-15	136
Holoien T. W.-S., Prieto J. L., Bersier D., et al.	ASASSN-14ae: a tidal disruption event at 200 Mpc	MNRAS	MODS	2014	http://adsabs.harvard.edu/abs/2014MNRAS.445.3263H	Dec-14	70
Genzel R., Förster Schreiber N. M., Rosario D., et al.	Evidence for Wide-spread Active Galactic Nucleus-driven Outflows in the Most Massive z ~ 1-2 Star-forming Galaxies	ApJ	LUCI		http://adsabs.harvard.edu/abs/2014ApJ...796....7G	Nov-14	74
Biller B. A., Liu M. C., Wahhaj Z., et al.	The Gemini/NICI Planet-Finding Campaign: The Frequency of Planets around Young Moving Group Stars	ApJ	PISCES	2011	http://adsabs.harvard.edu/abs/2013ApJ...777..160B	Nov-13	86
Skemer A. J., Hinz P. M., Esposito S., et al.	First Light LBT AO Images of HR 8799 bcde at 1.6 and 3.3 μm: New Discrepancies between Young Planets and Old Brown Dwarfs	ApJ	PISCES LMIRCam	2011	http://adsabs.harvard.edu/abs/2012ApJ...753...14S	Jul-12	94
Taubenberger S., Benetti S., Childress M., et al.	High luminosity, slow ejecta and persistent carbon lines: SN 2009dc challenges thermonuclear explosion scenarios	MNRAS	LUCI	2010	http://adsabs.harvard.edu/abs/2011MNRAS.412.2735T	Apr-11	100
Kochanek C. S., Beacom J. F., Kistler M. D., et al.	A Survey About Nothing: Monitoring a Million Supergiants for Failed Supernovae	ApJ	LBC	2007	http://adsabs.harvard.edu/abs/2008ApJ...684.1336K	Sep-08	122
Prieto J. L., Kistler M. D., Thompson T. A., et al.	Discovery of the Dust-Enshrouded Progenitor of SN 2008S with Spitzer	APJl	LBC	2009	http://adsabs.harvard.edu/abs/2008ApJ...681L...9P	Jul-08	139

A basic question (likely with many answers…)

What prevent the users to publish more from their LBTO data?