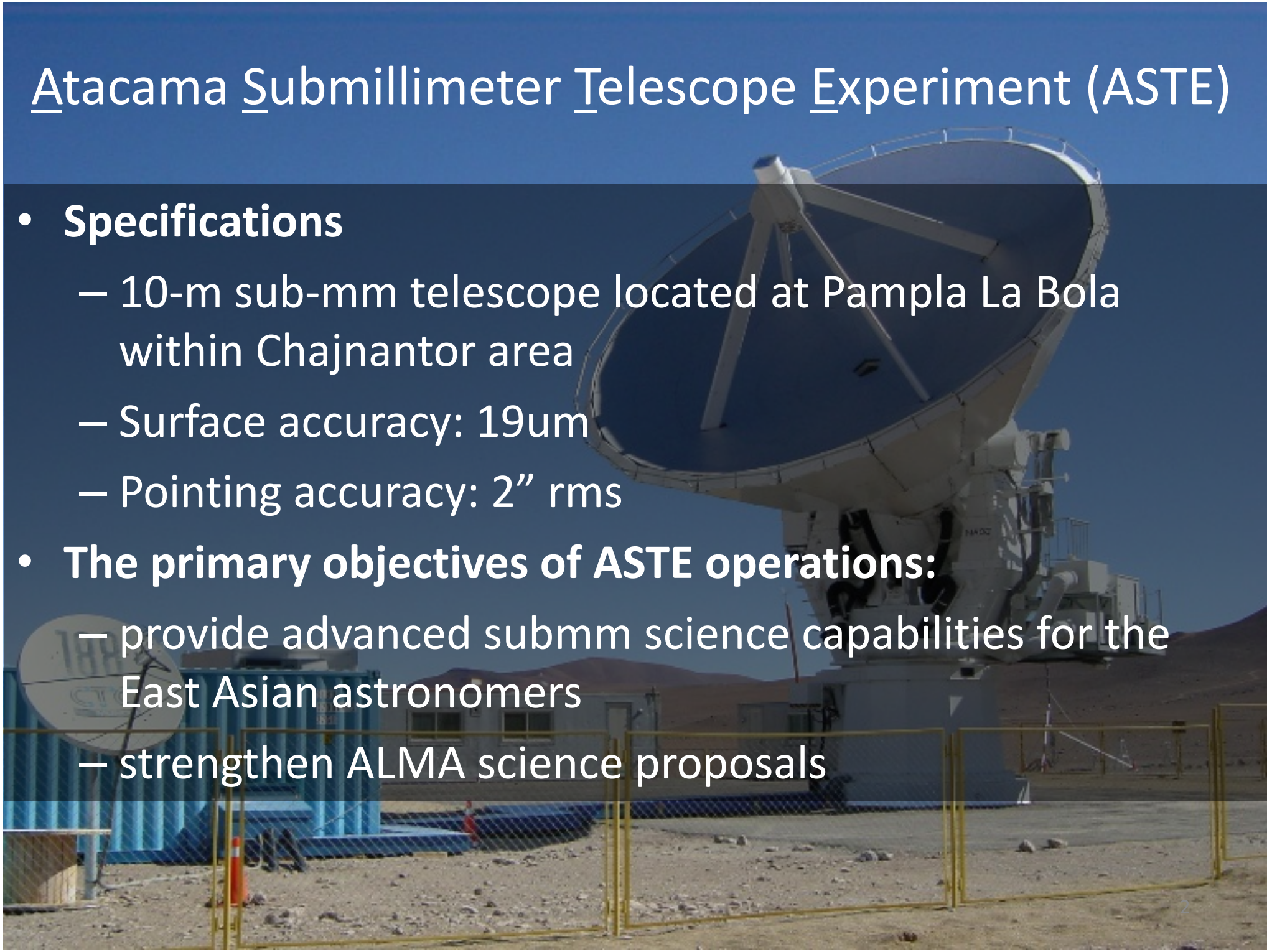
ASTE Status

Shin'ichiro Asayama, Daisuke Iono
and the ASTE team

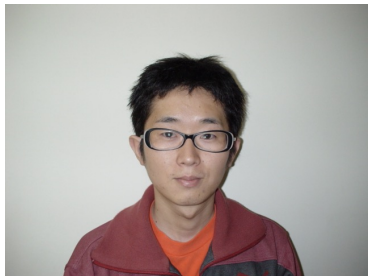
Atacama Submillimeter Telescope Experiment (ASTE)



- **Specifications**
  - 10-m sub-mm telescope located at Pampla La Bola within Chajnantor area
  - Surface accuracy: 19um
  - Pointing accuracy: 2” rms
- **The primary objectives of ASTE operations:**
  - provide advanced submm science capabilities for the East Asian astronomers
  - strengthen ALMA science proposals

ASTE Organization

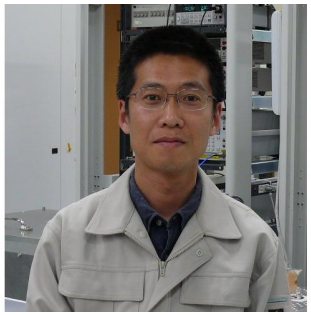
Takeshi Okuda
(JAO Sr Instrument Engineer
from April,2016)



Shin'ichiro Asayama

Masumi Yamada

Daisuke Iono



Yasunori Fujii

The University of Chile,
and many Japanese Universities:
The University of Tokyo,
Hokkaido University,
Nagoya University,
Keio University,
Osaka Prefecture University,
Ibaraki University,
The University of Electro-Communications, and
Joetsu University of Education.

ASTE Instrumentation

Receivers

Receiver	Type	Freq. [GHz]	HPBW [arcsec]	Npix	Npol
DASH345	Heterodyne	324-372	22	1	2
Band8	Heterodyne	385-500	17	1	2

Spectrometer

Spectrometer	Type	Quantization	BW [MHz]	Nchan	Δf [MHz]
MAC	XF	2-bit	512	1024	0.5
			128		0.125
WHSF	FX	3-bit	4096	4096*	1.0
			2048		0.5

Science Operation

- Call for proposals for East Asian community (JP, TW, KR): 90%
  - Evaluated by the mm/submm Time Allocation Committee
    - General
    - Joint observation with 45m (not offered for 2017)
    - Guaranteed Time Observation (GTO)
    - DDT (up to 5% of time in 2017) (evaluated every 2 months)
- Chilean Time (CT) evaluated by CNTAC: 10%
- Observers remotely conduct their observations from Mitaka, SPdA facility, and their institutes (for experts).

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ASTE Science Operation – Status

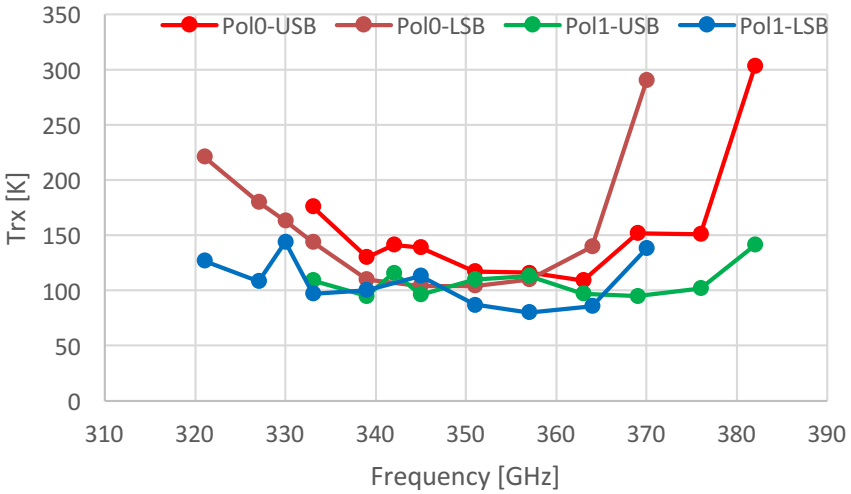
ASTE Science Operation - 2016 Report

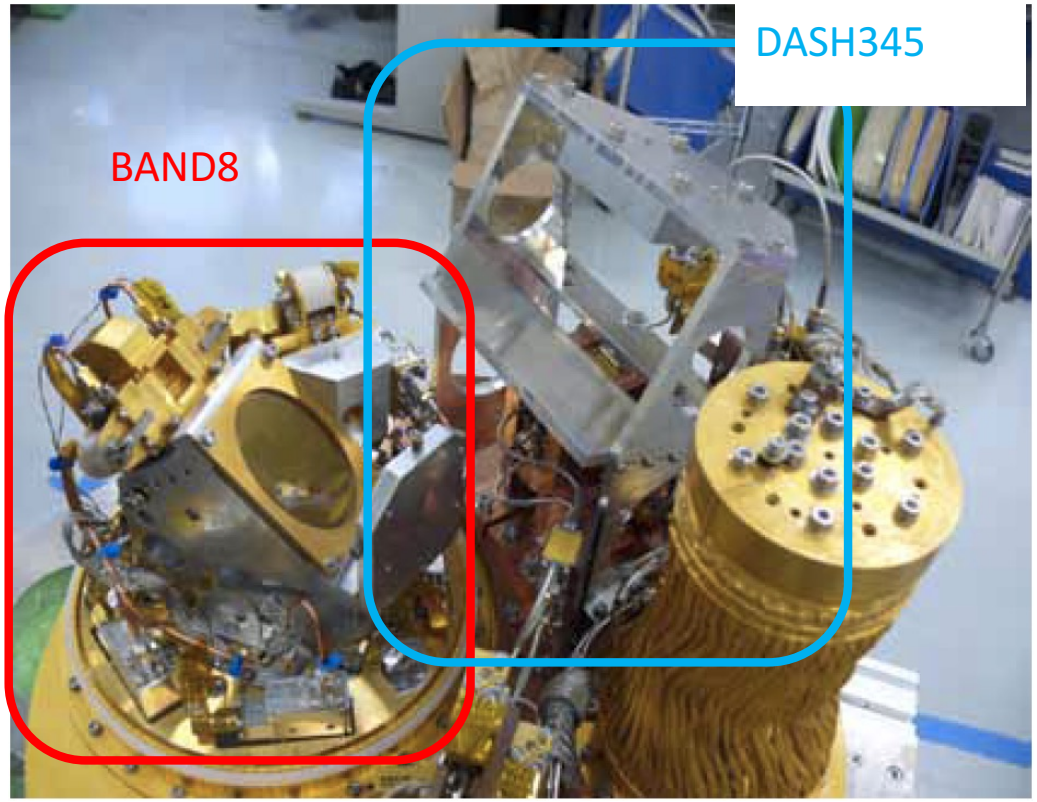
ASTECAM CSV (March – July, 2016)

- Achieved good sensitivity (comparable to LABOCA and SCUBA2) and mapping speed requirement at 345GHz
- However, problems pertaining to 270GHz band and low yield resulted in significant concerns.
- Currently not in scope for 2018 science operation

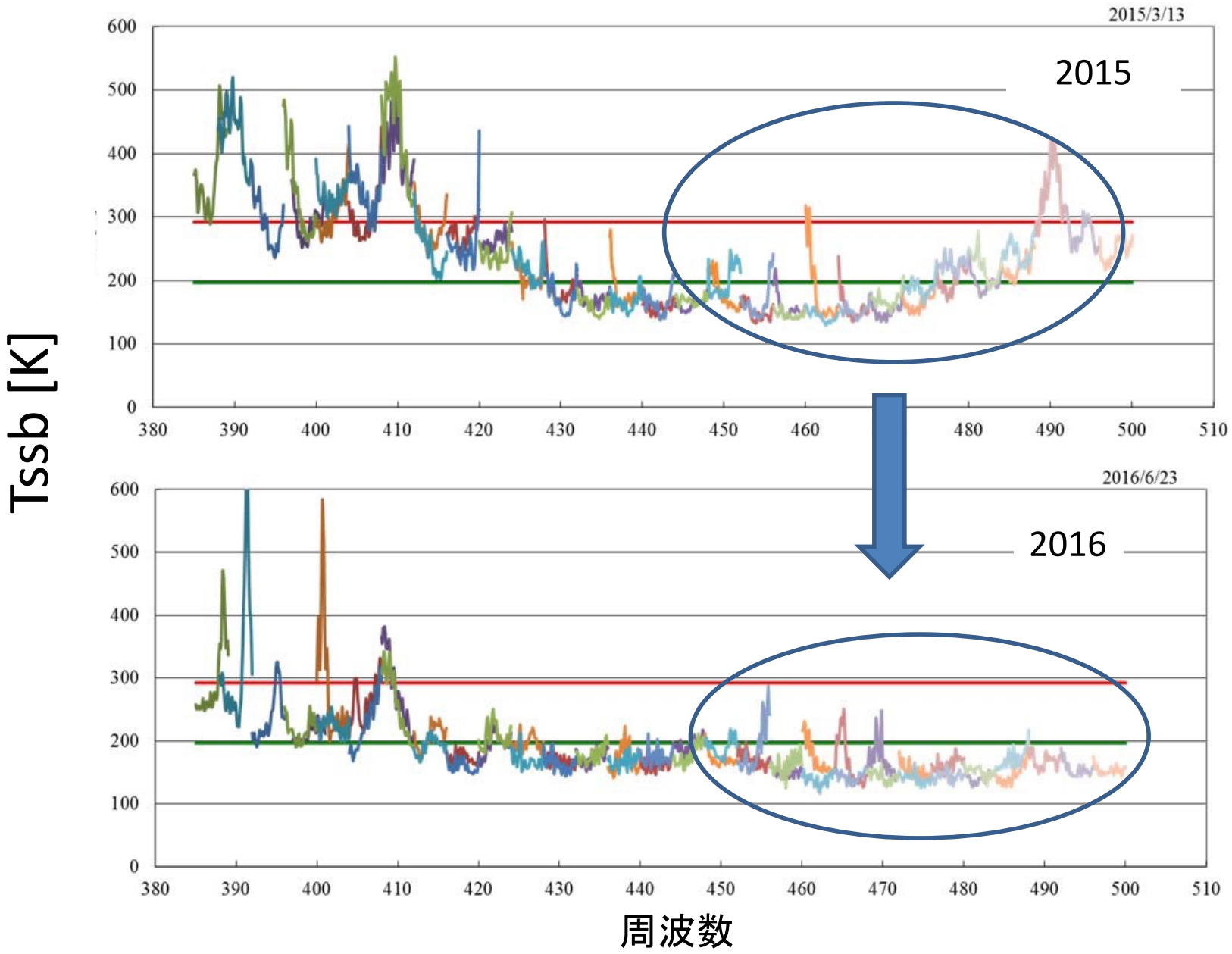
ASTE Science Operation - 2016 Report

- DASH345
  - 1-pix 345GHz-band RX (2-pol/2SB)
    - Tsys (DASH345) < Tsys(CATS345)
- ASTE BAND8
  - Fixed and upgraded BAND8 QM
  - Operated by ALMA FEMC (NRAO)





ASTE Science Operation - 2016 Report



ASTE Science Operation - 2016 Report

September – December, 2016 (available time ~ 900 hours)

	Submitted (EA only)	Details			
		Open Use (492GHz time shown in parentheses)	Joint	GTO	Chile
# submitted	14	7 (3)	6	1	
# accepted	11	6 (3)	4	1	3
Request time [h]	428	262 (117)	121	45	
Accepted time [h]	376	241 (117)	90	45	90

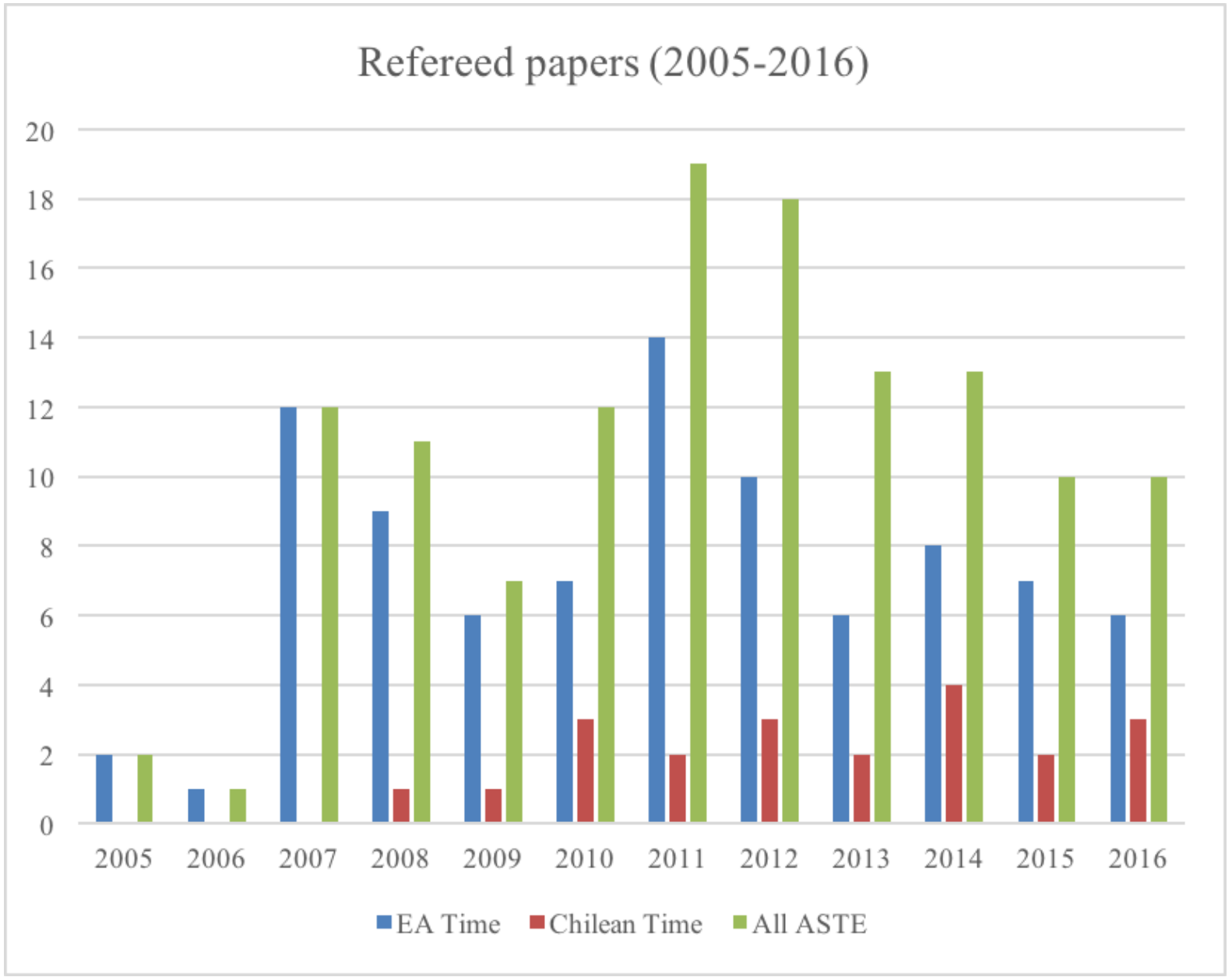
Note: Only a single polarization was offered at 492 GHz due to a malfunction of one of the receivers.

Call For Proposals 2017

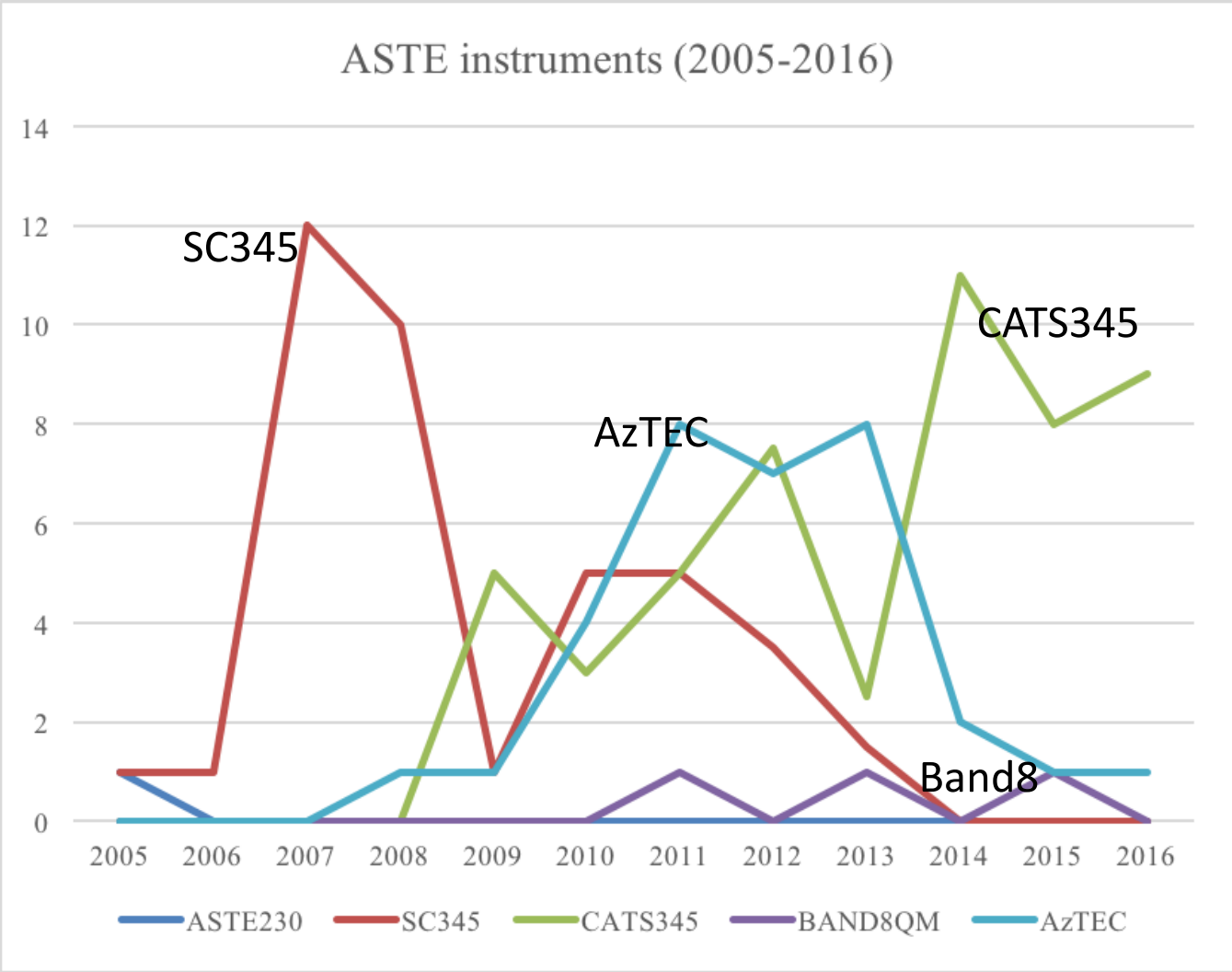
- Available observing mode:
  - 350GHz (DASH345) and 400 GHz (ASTE Band 8)
  - both spectrometers (MAC/WHSF)
- Scheduling period: June 1st to September 30th, 2017
- Total observing time: 1000 hours between 0-6h and 11-24h in LST
- No Joint proposals
- Submission deadline December 13, 2016 (15:00 JST or 6:00 UT)

Received: 14 proposals, 579 hours
Accepted: 12 proposals, 422 hours

Publication Status



Publication Status



- Publication of CATS345 rising
- Publication from Band 8 is lacking behind

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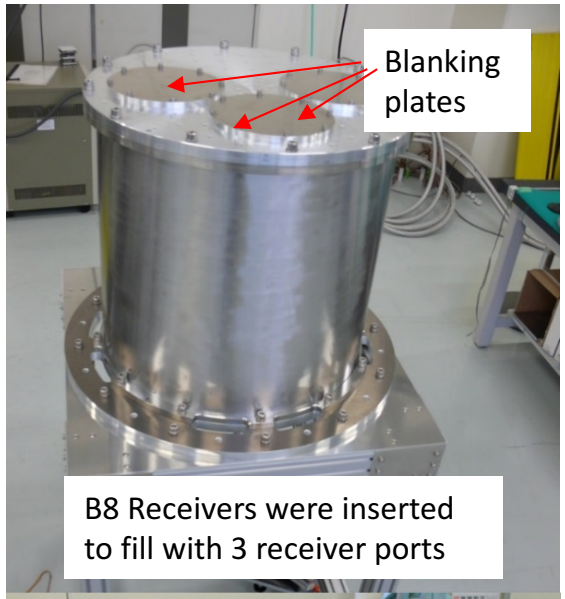
Mid-term Operation Plan

Medium-term Operation Plan

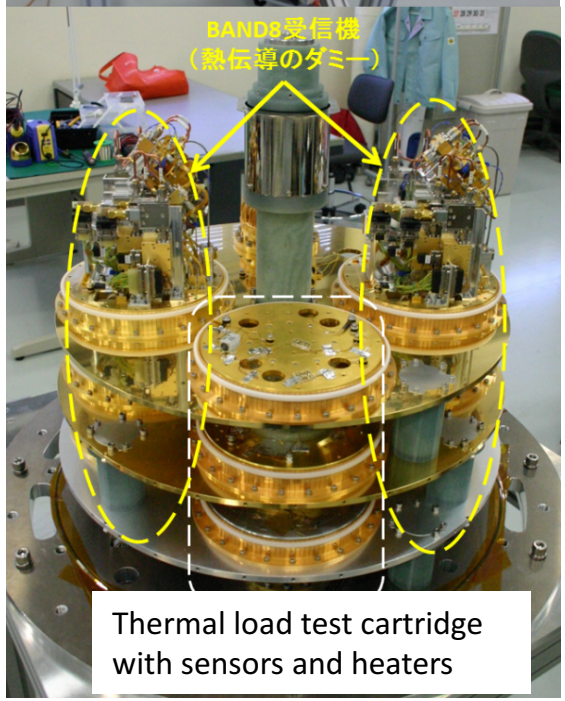
- Steady-state science operations with *ASTE future instruments*
- To maximize observing time for EA and Chilean community.
- To enhance synergy with ALMA and other telescopes including NRO 45m.
- ASTE Development Project to be extendable to ALMA.

Spectroscopic Observations

- New 3-cartridge cryostat
  - Operate 3 cartridge-type receivers simultaneously.
  - Developed by NAOJ ATC
  - Operate on ASTE from 2017
- Cartridge-type receivers
  - New 345GHz-band (modified DASH345)
  - ASTE BAND8
  - 0.9/1.3THz-RX (The University of Tokyo)
  - 230GHz-RX (The University of Electro-Communications)
  - 1-beam/4-beam BAND7+8 developed by KASI
- GPU Spectrometer developed by KASI

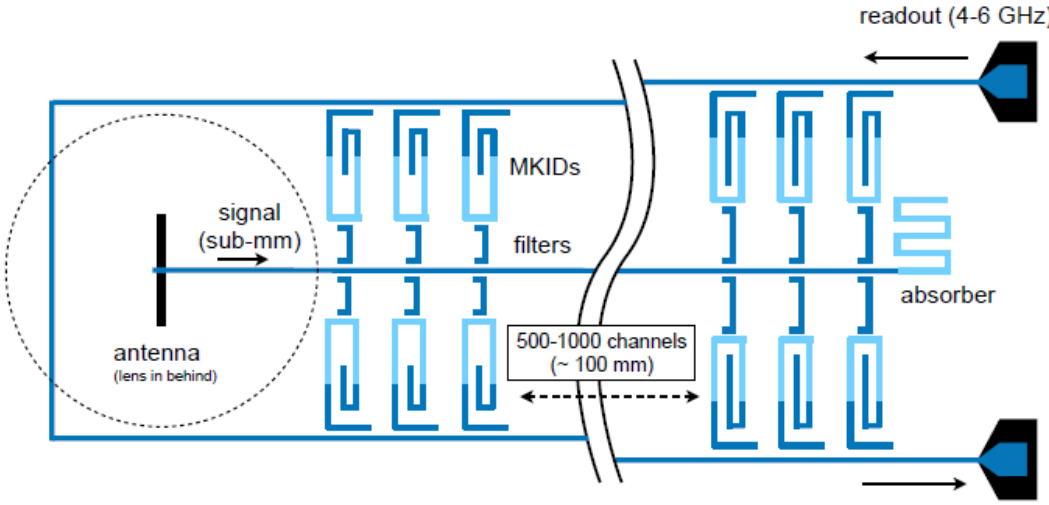


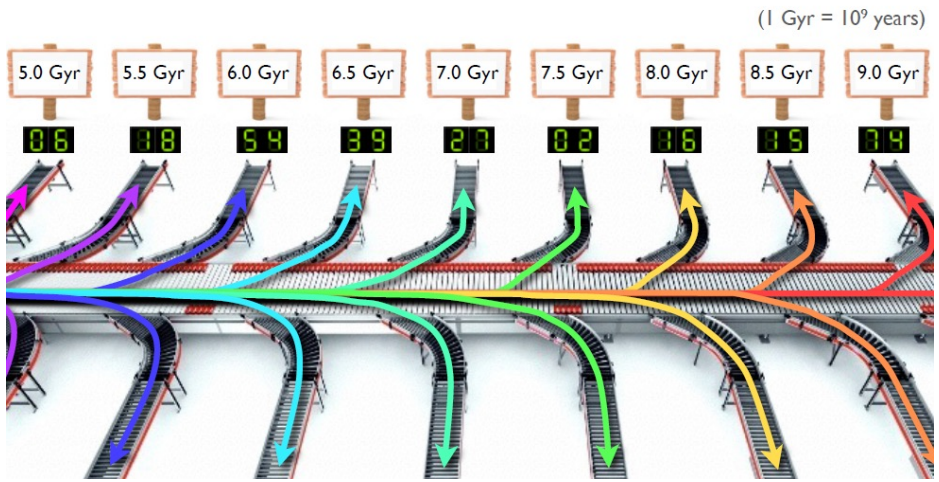
B8 Receivers were inserted to fill with 3 receiver ports



Thermal load test cartridge with sensors and heaters

DESHIMA on ASTE





- On-chip imaging spectrograph based on superconducting resonators
- Developed by TU Delft
- 326-905 GHz w/ R=500
- Measure distance to submm galaxies

Summary

- The NAOJ Chile Observatory has established steady-state science operations of ASTE at 345 GHz and 450 GHz
- 2017 science operation will begin in June, with commissioning of DESHIMA in late 2017.
- The mid-term operation plan of ASTE future instruments has been developed, with a long term vision that is connected to ALMA development and upgrades.