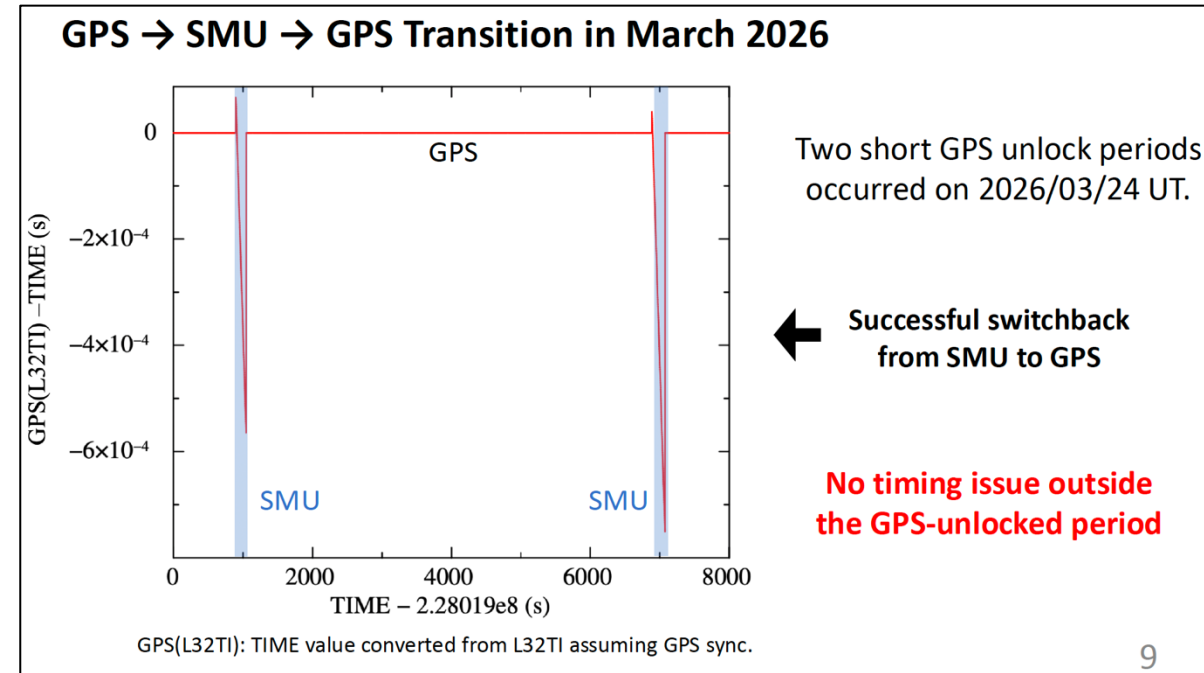
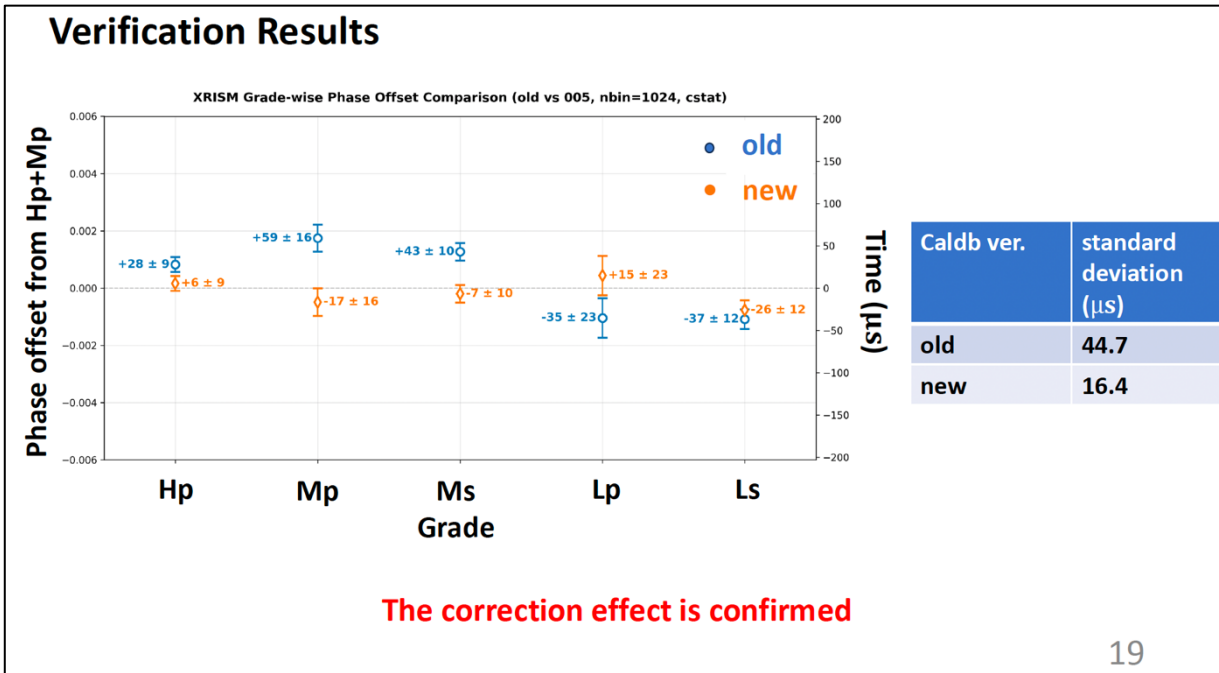


# Timing WG

Megumi Shidatsu, Yukikatsu Terada  
(Timing WG chair/co-chair)

# Presentation (20 min x 1)

## 1. Verification of the Timing Accuracy of XRISM/Resolve with the Updated CALDB (Y. Motogami)



# Paper status



- 1. Systematic timing cross calibration (led by Matteo)  
inc. technique description.**
  - Chandra, EP, Fermi, Hitomi, HXMT, IXPE, MAXI, NICER, NinjaSat, NuSTAR, Suzaku, Swift, XMM, XRISM, and RXTE data are included  
→ published!!  
Bachetti et al. (2026), PASP, 138, 014501
- 2. Simultaneous timing calibration campaign in Mar 2024 (XRISM, NICER, NuSTAR)  
(led by XRISM)**
  - XRISM+NuSTAR+NICER results have been published as JATIS papers (2025)  
Terada et al 2025, Shidatsu et al 2025, and Sawada et al 2025.
- 3. Systematic timing cross calibration in hard X-ray to GeV gamma-ray mission  
(led by Lucien)**
  - See presentation in 13<sup>th</sup> IACHEC (2018) -- cont. (?)
- 4. Other paper plans?**

# PoC for instruments on Timing

<https://wikis.mit.edu/confluence/display/iachec/Timing>

<b>Mission</b>	<b>PoC (last updated 27 May 2025)</b>
RXTE	Craig Markwardt, Arnold Rots
Chandra	Vinay Kashyap, Arnold Rots
XMM-Newton	Felix Fuerst, Simon Rosen
Swift	Amy Lien, Giancarlo Cusumano
INTEGRAL	Guillaume Belanger, Volodymyr SAVCHENKO, Lucien Kuiper
NuSTAR	Matteo Bachetti, Katja Pottschmidt
Astrosat	Gulab Dewangan, Dipankar Bhattacharya
HXMT	Xiaobo LI
NICER	Craig Markwardt, Teruaki Enoto, Katja Pottschmidt
eROSITA	Michael Freyberg
Suzaku	Yukikatsu Terada
Hitomi	Yukikatsu Terada
XRISM	Yukikatsu Terada, Megumi Shidatsu, Tomokage Yoneyama
Einstein Probe	Juan Zhang
SVOM GRM·ECLAIRs · MXT	Shijie Zheng, Olivier Godet, Diego Gotz
NinjaSat	Naoyuki Ota, Takuya Takahashi
GRID	Longhao Li
MAXI	Megumi Shidatsu, Mutsumi Sugizaki

# Updating timing tables

<https://wikis.mit.edu/confluence/display/iachec/Timing>

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  - Timing

Mission/Instruments	Science Requirement Absolute Time		Timing System Design		Timing Characteristics		
	Requirement	Goal	GPS Receiver	Clock Stability	Offset from the Reference	Deviation, sigma	Reference Time
RXTE/PCA ★	10 $\mu$ sec	none	No		Calibrated: 1 $\mu$ sec  Uncalibrated: -0 usec (Absolute, not relative to radio)	Calibrated: 3.4 $\mu$ sec  Uncalibrated: 100 usec (max) -50 usec (std)	TAI
RXTE/HEXTE ★	10 $\mu$ sec	none			See above	See above	
Chandra/ACIS	0.25625 s (one minor frame start time)	0.001 s (synchronize minor frame starts)	No (sync DSN)	3.2 $\mu$ sec	285 $\pm$ 6 $\mu$ sec		
Chandra/HRC		16 $\mu$ sec			4 $\pm$ 4 $\mu$ sec		

# Coordinated observations for timing calibration?

## **Crab**

XRISM: plan to observe every AO cycle (visibility: Feb. 13 - Apr. 14, Aug. 17 – Oct. 18)

**Other sources?**