



Operation of the telescope

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Subaru UM 2012

Summary

- We are continuing to *maintain and upgrade* the telescope sub systems
- We are seeing *higher rate of failure* from aging of parts and human errors

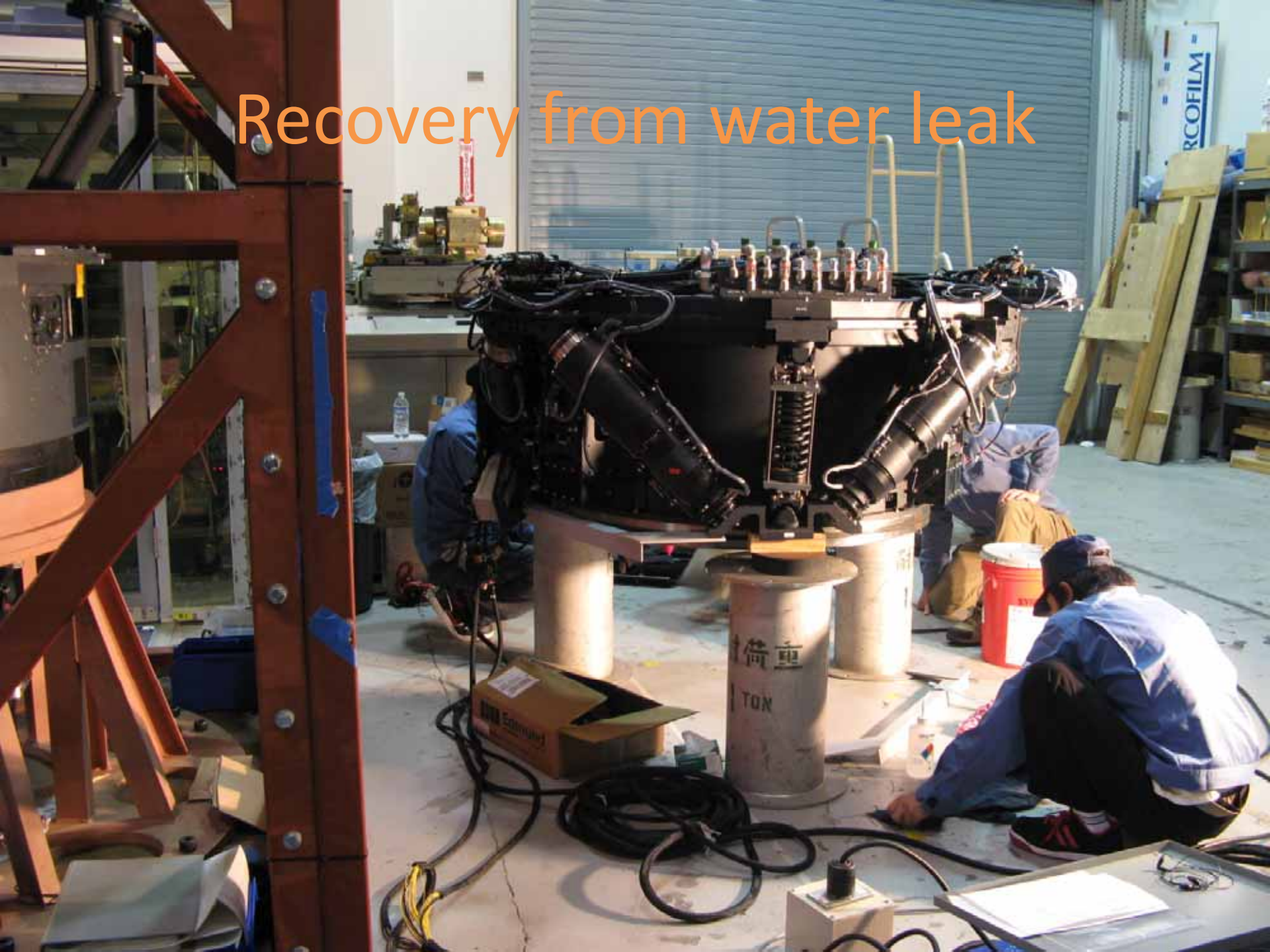
Maintenance & Upgrade

- Recovery from water leak
- Insertion of leap second
- Maintenance of M1 actuators
- Replacement of electrical parts
- Monitor of rubber springs
- Measurement of vibrations
- Replacement of IR suppression mirrors
- Adjustment of LGRs
- Commissioning of POpt2/HSC
- Upgrade of LCUs

Recovery from water leak



Recovery from water leak



Recovery from water leak



UT Y D H M S
' 12:139:22:17:02 REMOTE

TIME CODE GENERATOR TRANSLATOR TXC-101DTR-6D

ISI TIME CODE GENERATOR TRANSLATOR II

GPS MODE SYNC LOCK +LEAP
UTC 12Y139D22H17M02S FRI -000.843ms

Inserted leap second

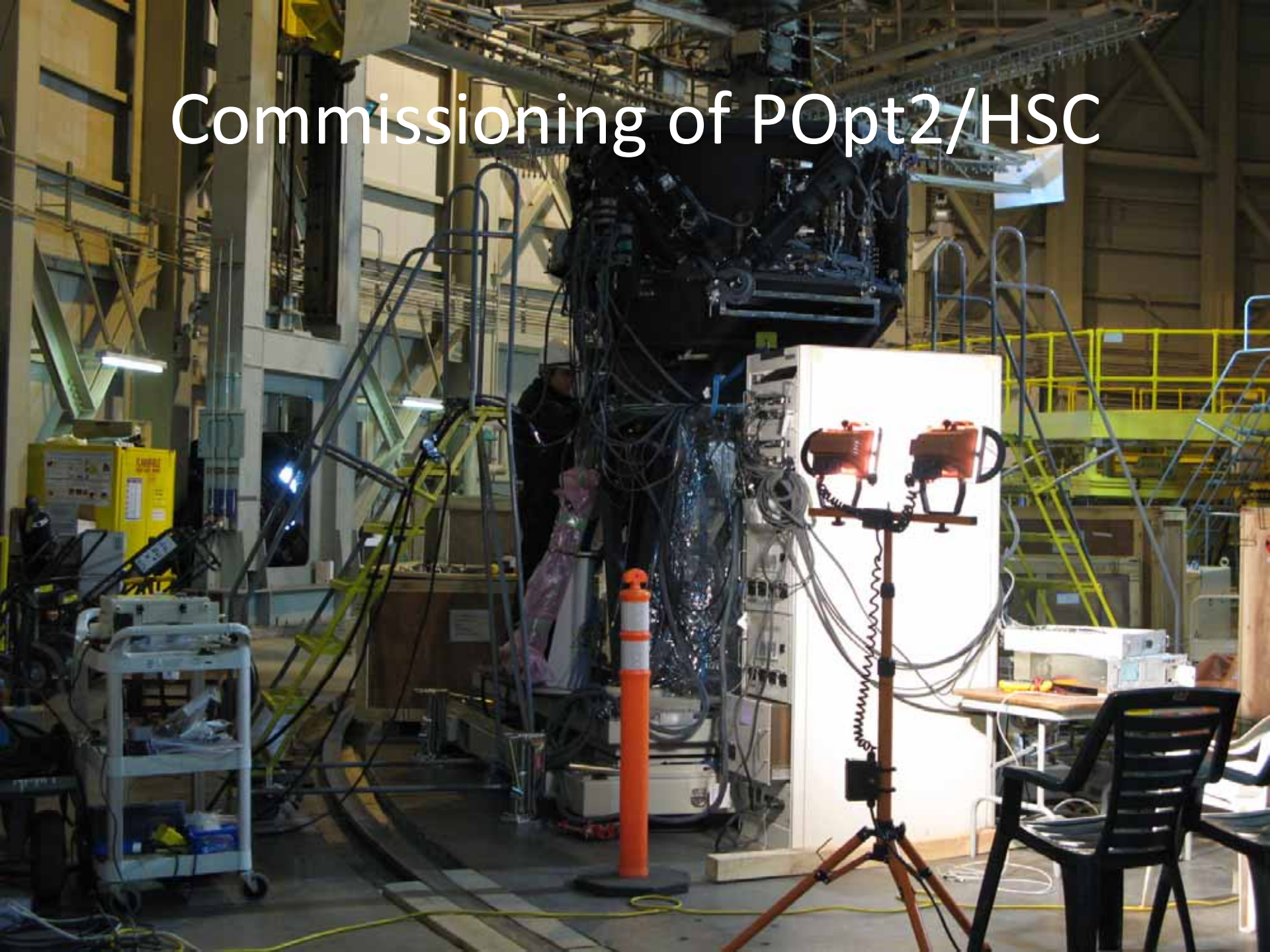
TIME CODE INTERFACE

SW CONT

NTP IF

SEL IF

Commissioning of POpt2/HSC



Commissioning of POpt2/HSC



Commissioning of POpt2/HSC



Commissioning of PO Pt2/HSC



Commissioning of POpt2/HSC



Maintenance of M1 actuators



Upgraded FRCU



 PUSH

TCADCU

RADC: -0.02deg
CADC: -0.02deg

POWER

FAULT



TCFRCU

☒ ALARM ☒ REMOTE ☐ SLEW DRIVE

FOCUS:CS

MIR:---

☒ ROTR [°]

REAL: -0.300080

CMD: -0.300000

DRMODE: POSN

Default Alarm Status Monitor Data Input

DR ON			POSN	NONE	NONE	CS	
DR OFF			SLEW	RED	IR	NSOP	
				BLUE	STOP	NSIR	
				STOP			
LIM RESET							

ROTR

DR MODE

NSOP
InR MIR

NSIR
InR MIR

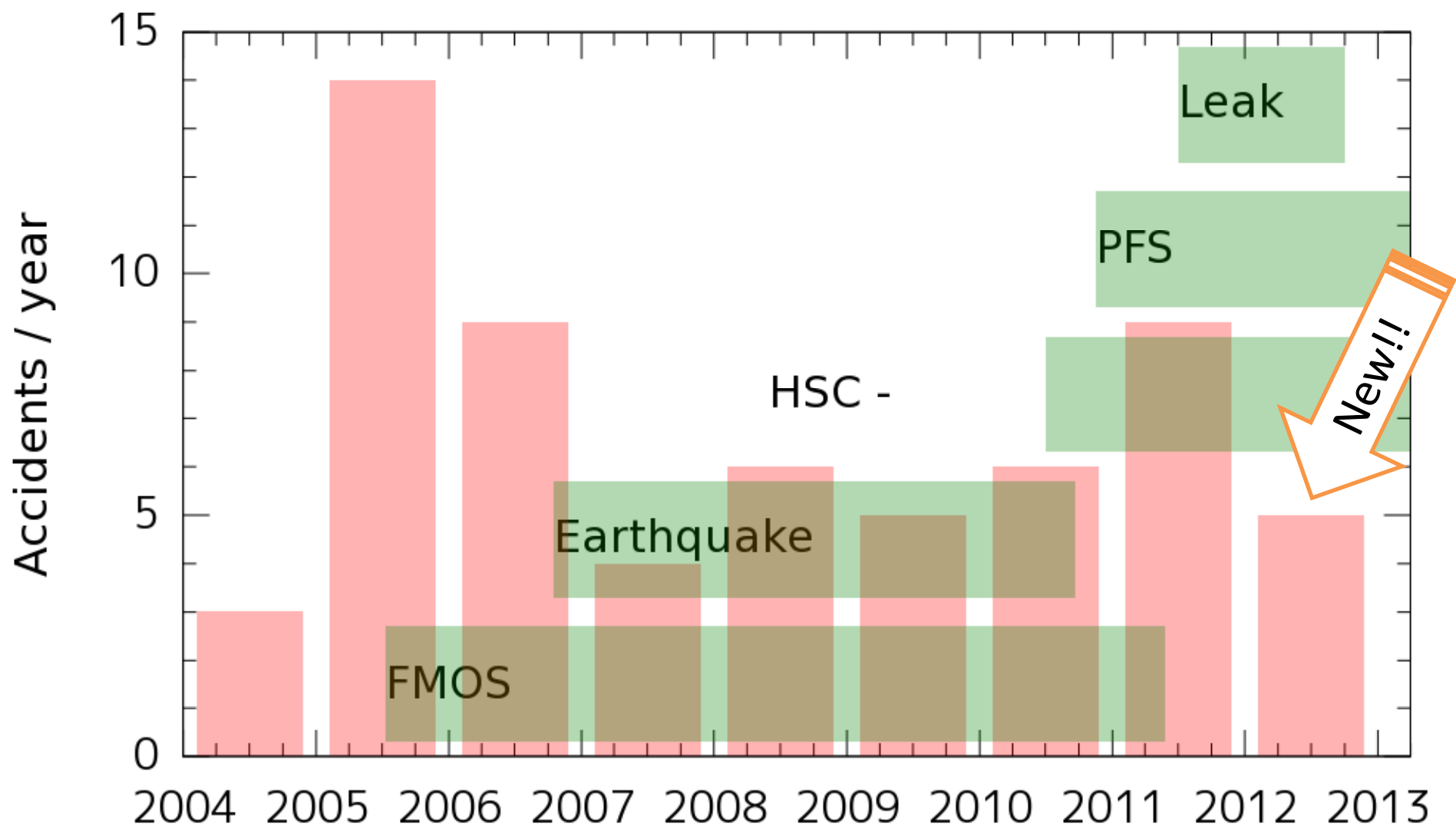
FOCUS
MODE

INFO



TCADCU

Troubles



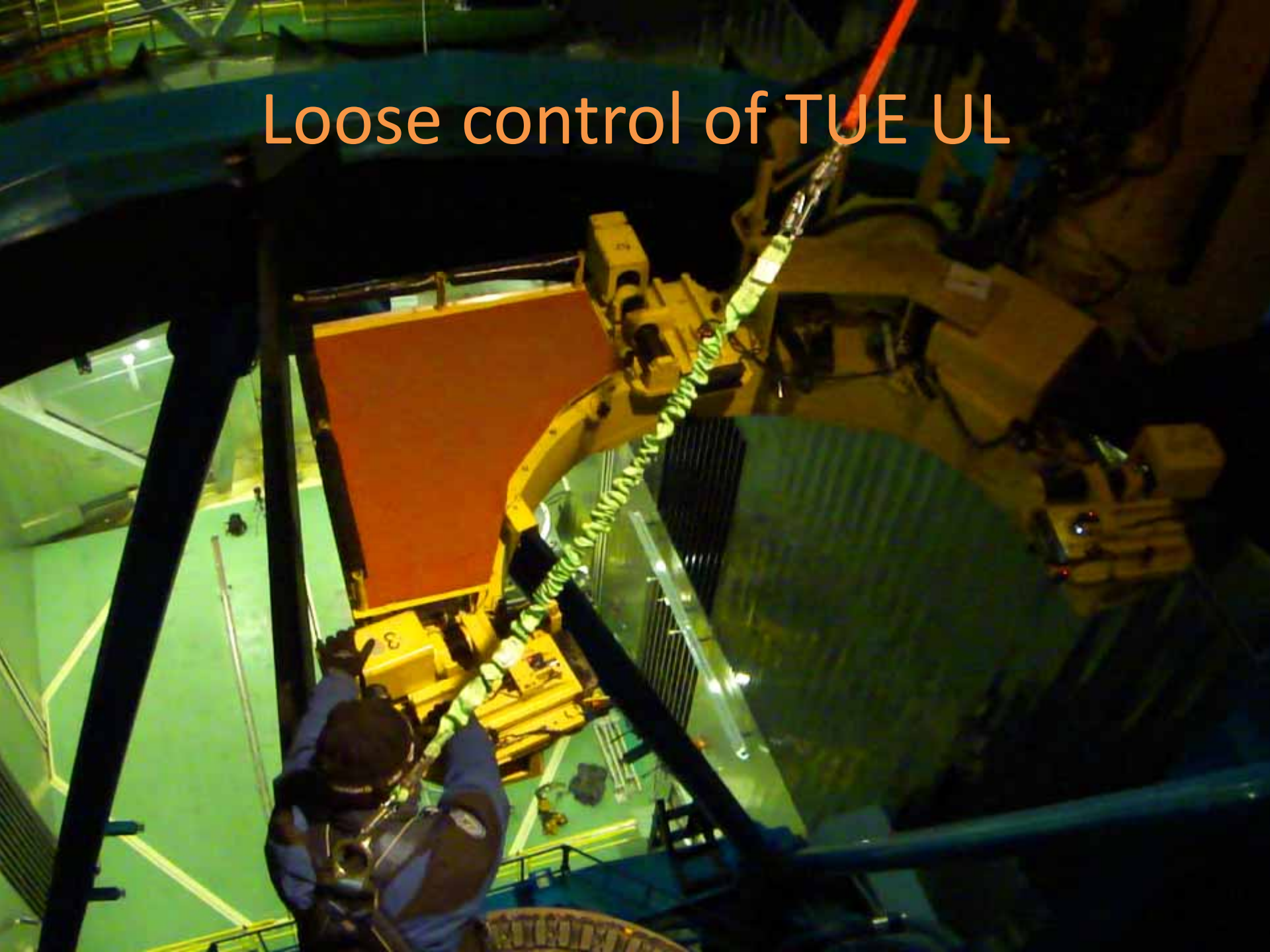
Troubles from aging

- Loose control of TUE UL θ axis
- Angle offset of NsOpt ImR
- Loose connections on spider connectors
- Problem in moving AGSH shutters
- Water leak in NsIR AGSH prove
- Short circuit and cut on electrical wires
- Faulty sensors
- Warmer coolant from Chiller A
- Cooling problem on NsOpt SV
- ...

Troubles from human errors and unknown reasons

- Broke mechanisms on TUE UL
- Trouble in using AO188 with NsOpt M2
- Broke driver mechanism on air dumper on great wall
- Broken He hoses on Cs InR
- Oil leak from Cs ADC
- Trouble in rotating Cs ADC
- Intermittent fault from Actuator 8-29
- Black out in the dome
- ...

Loose control of TUE UL



Loose control of TUE UL



Loose control of TUE UL



Loose connections



Loose connections



Loose connections



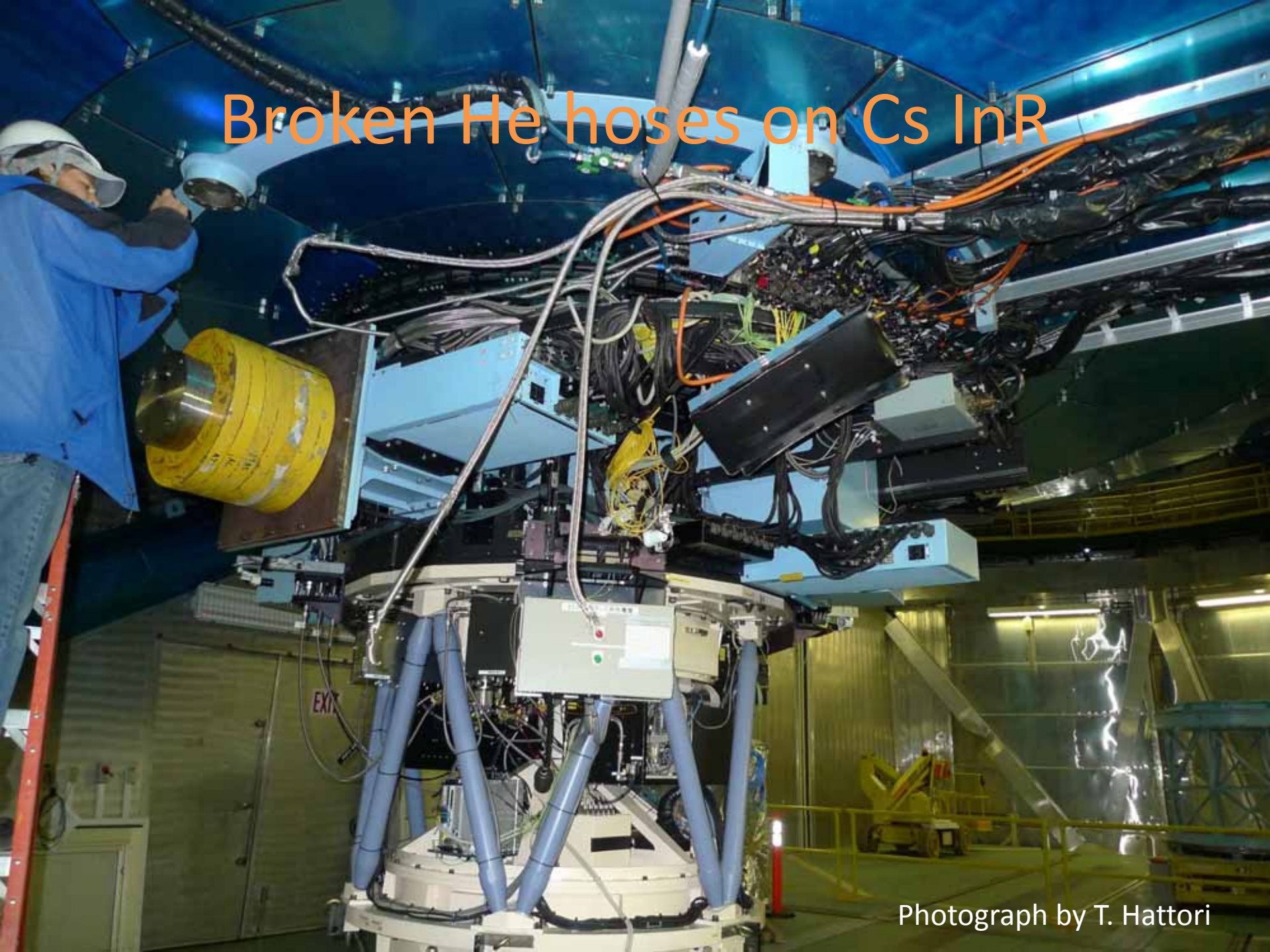
Angle offset of NsOpt ImR



Angle offset of NsOpt ImR



Broken He hoses on Cs InR



Photograph by T. Hattori

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Photograph by Takiura