Chilean LAT (CHLAT) Updates

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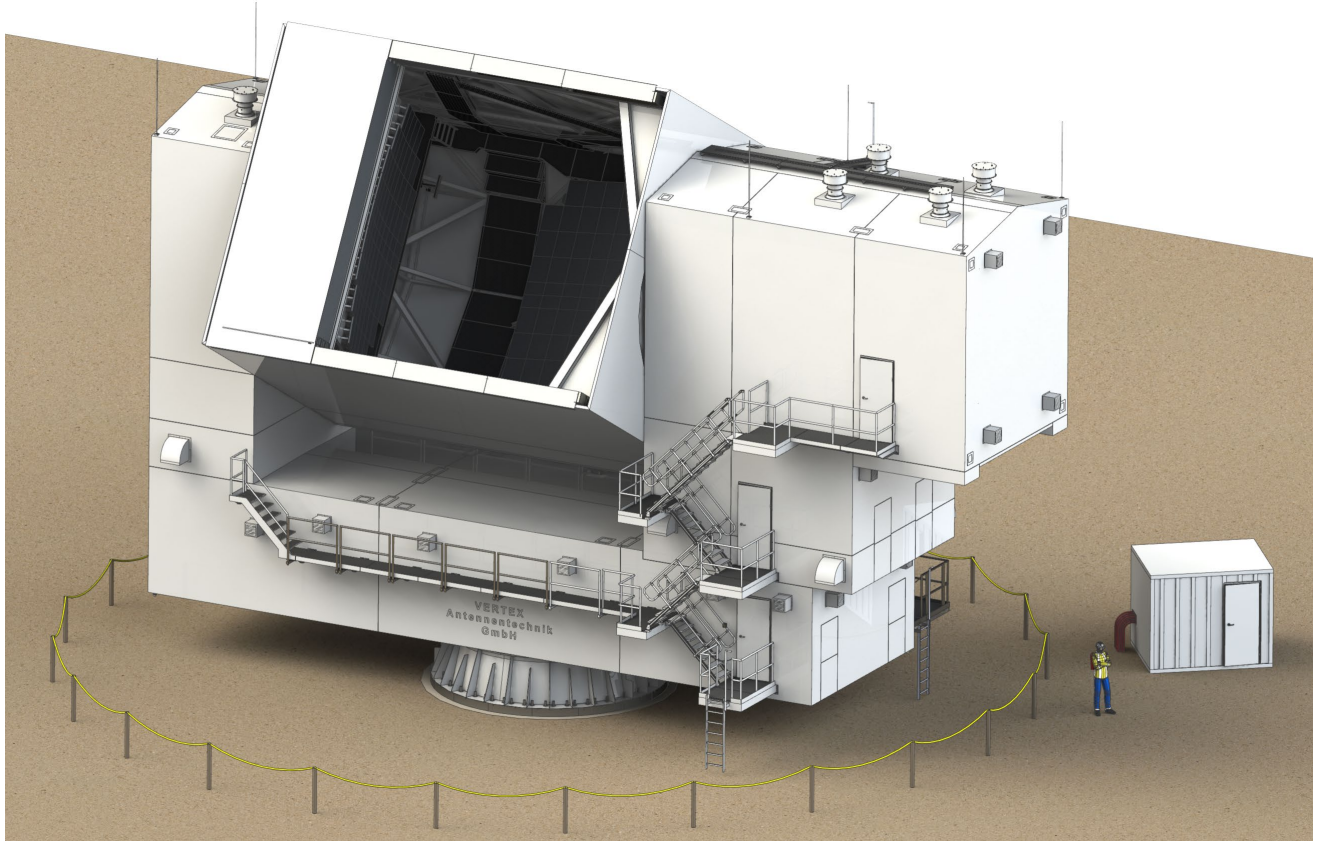
CMB-S4

Overview

- Two versions designed in parallel, CCAT-prime (FYST) and SOLAT
- Parallel manufacturing, series assembly, full trial assembly in Germany
- 6-m, off-axis, segmented, coma-corrected, Cross-Dragone design
- Primary, 77 aluminum panels; secondary, 69 panels;
- Max. emissivity 0.9% @ 1 mm
- Max AZ speed = 3 deg/sec, max AZ acceleration = 6 deg/sec
- 2.5 sec turnaround time from max. speed (goal 1.5 sec)
- EL axis aligned to receiver chief ray, EL range 0 to 180 (stow at -90), enables receiver footprint 180° rotation on sky
- About 50 tons EL axis, 200 tons AZ axis, 220 tons total
- Progress slowed due to COVID-19, SOLAT arriving 2022, FYST 2023

FYST / SOLAT



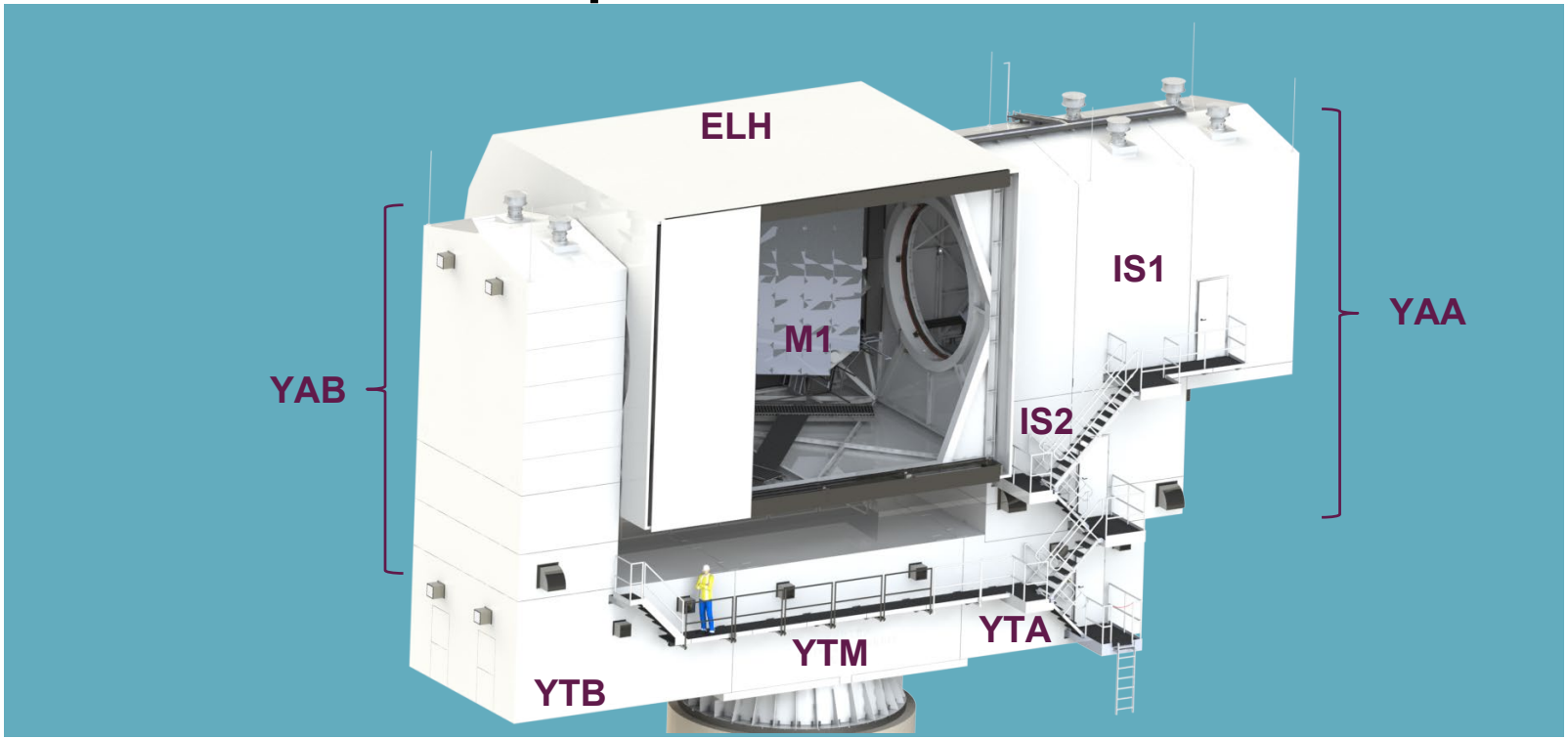
Site Environments

	FYST	SOLAT
Altitude {m}	5600	5200
Operating air temperature {°C}	-21 to +9	-21 to +15
Observing wind {m/s}	< 15	
Survival wind {m/s}	69	
Seismic	g/3	
Ice / snow	1cm / 120 kg/m^2	1cm / 100 kg/m^2

Design Differences

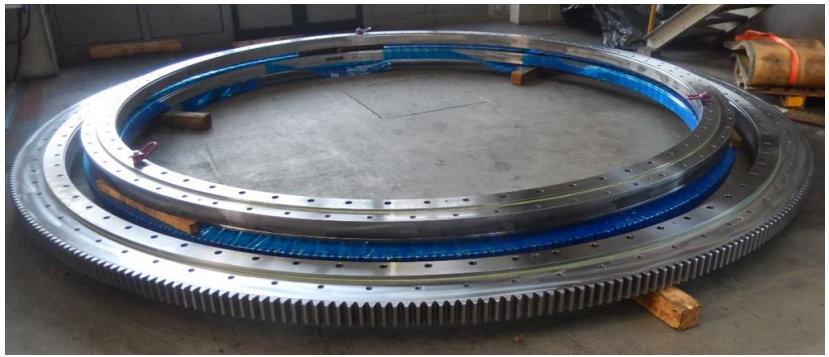
	FYST	SOLAT
Wavelength range	200 μm to 3 mm	1 to 15 mm
Receivers	Multiple	Single
HWFE {μm}	11	35
Scan pointing knowledge {arcsec}	1.4	4
Scan following error {arcsec}	7	10
Pointing stability {arcsec}	1.4	10
EL Housing	Invar	Steel
Receiver Co-rotator	No	Yes
Shutter	Yes	No

Initialism Map

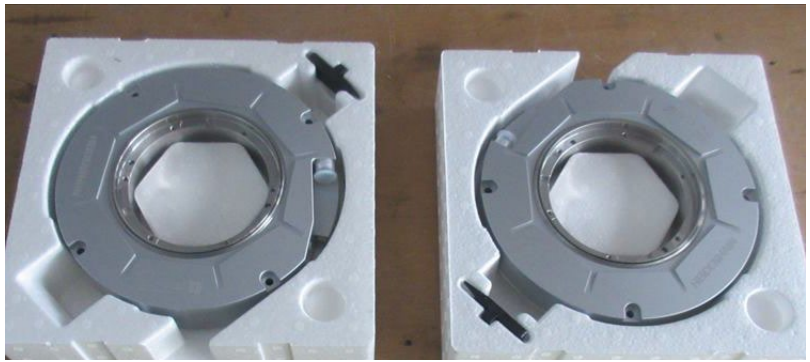


Components

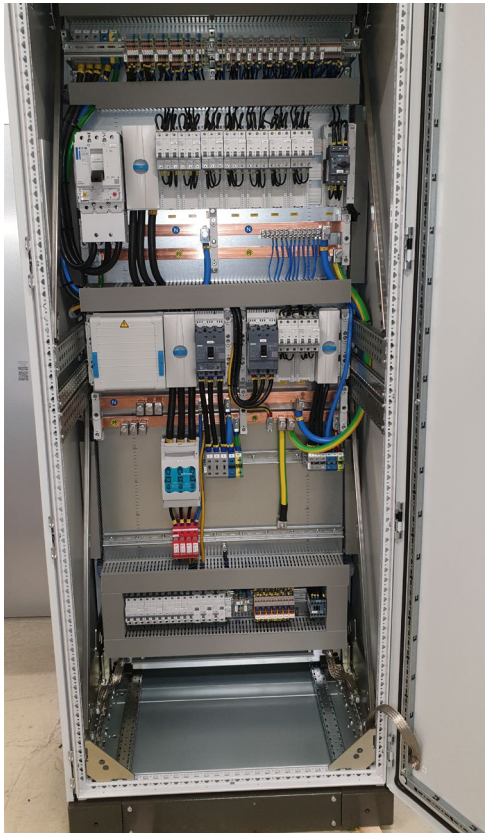
Bearings



Encoders

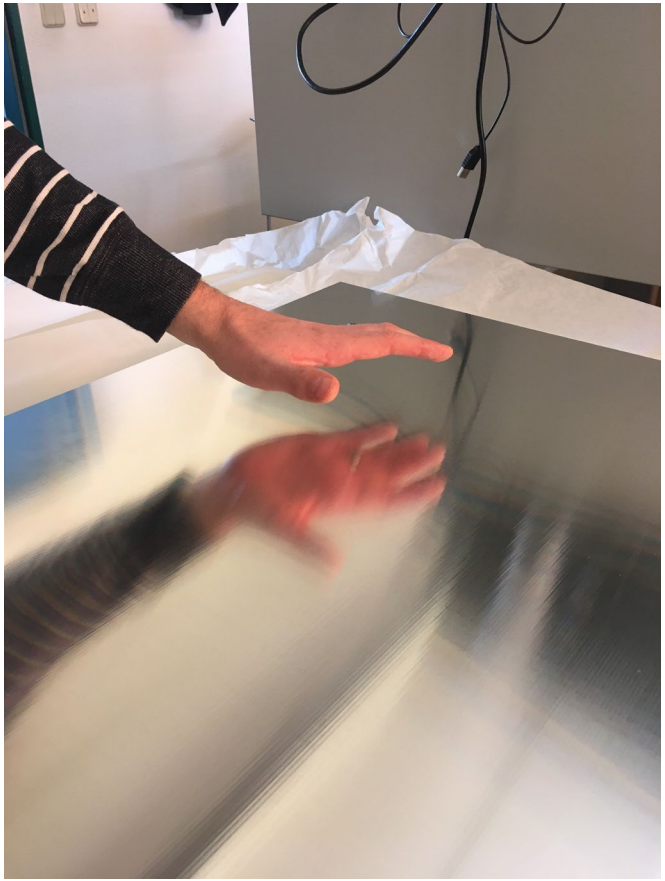


Gearboxes, motors



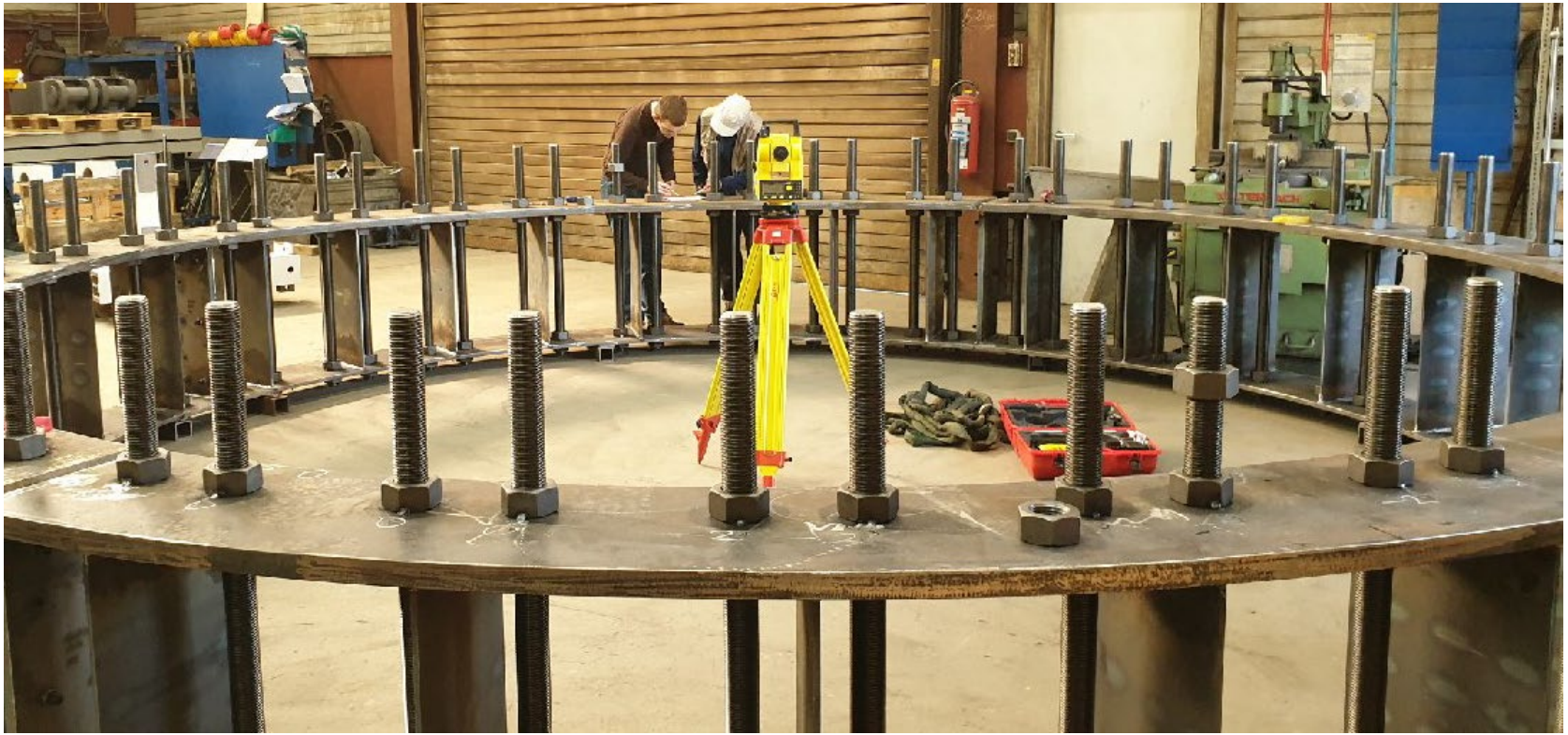
Cabinets, UPS

Panels



SOLAT 146 panels done; FYST ~50%

Foundation Anchors

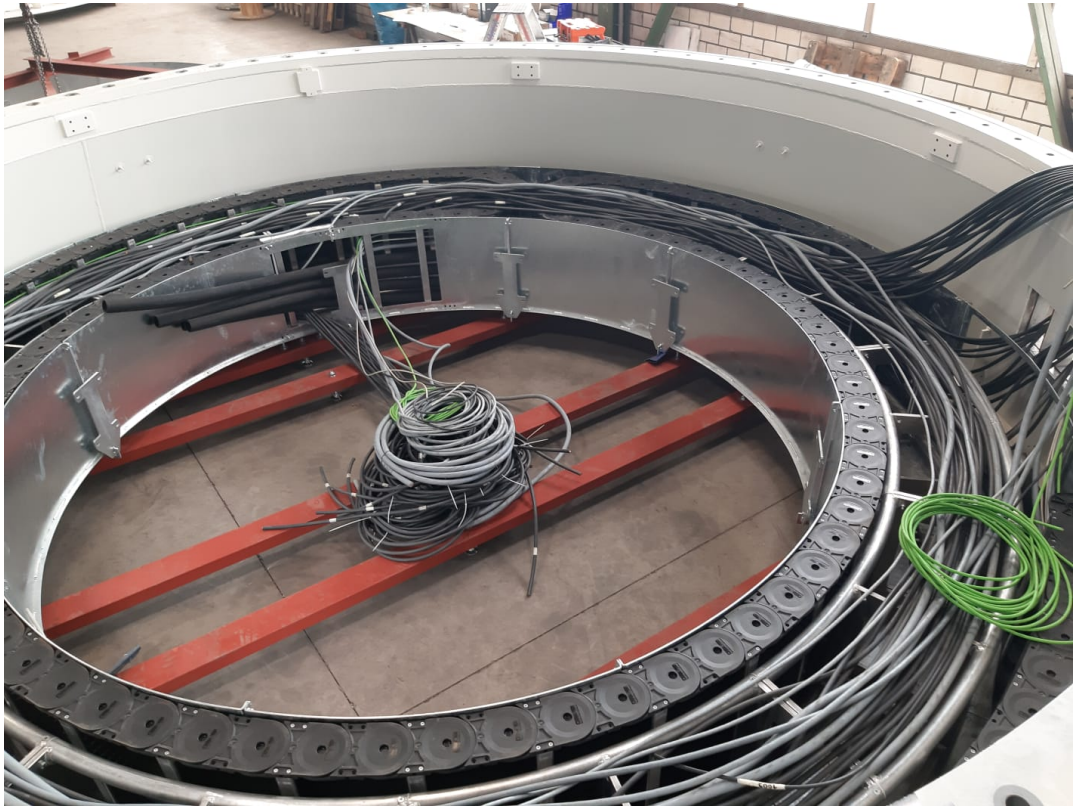


Foundation anchors

Support Cone

Support Cone

AZ Cable Wrap



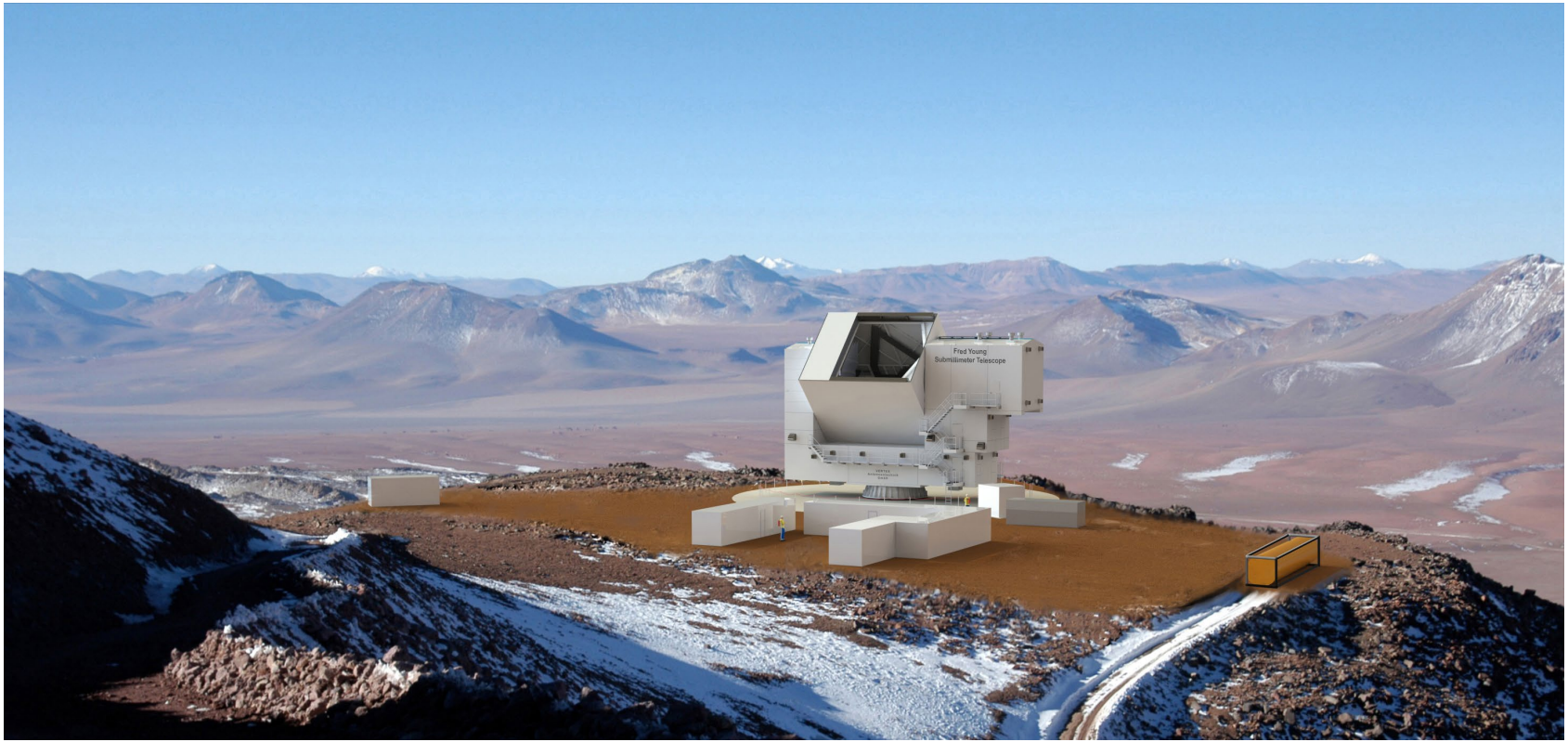
Yoke Traverse Sections

YTM Transport

YTM Machining

YTM Pre-integration

Thanks!



Backup slide – FYST Laser Metrology