

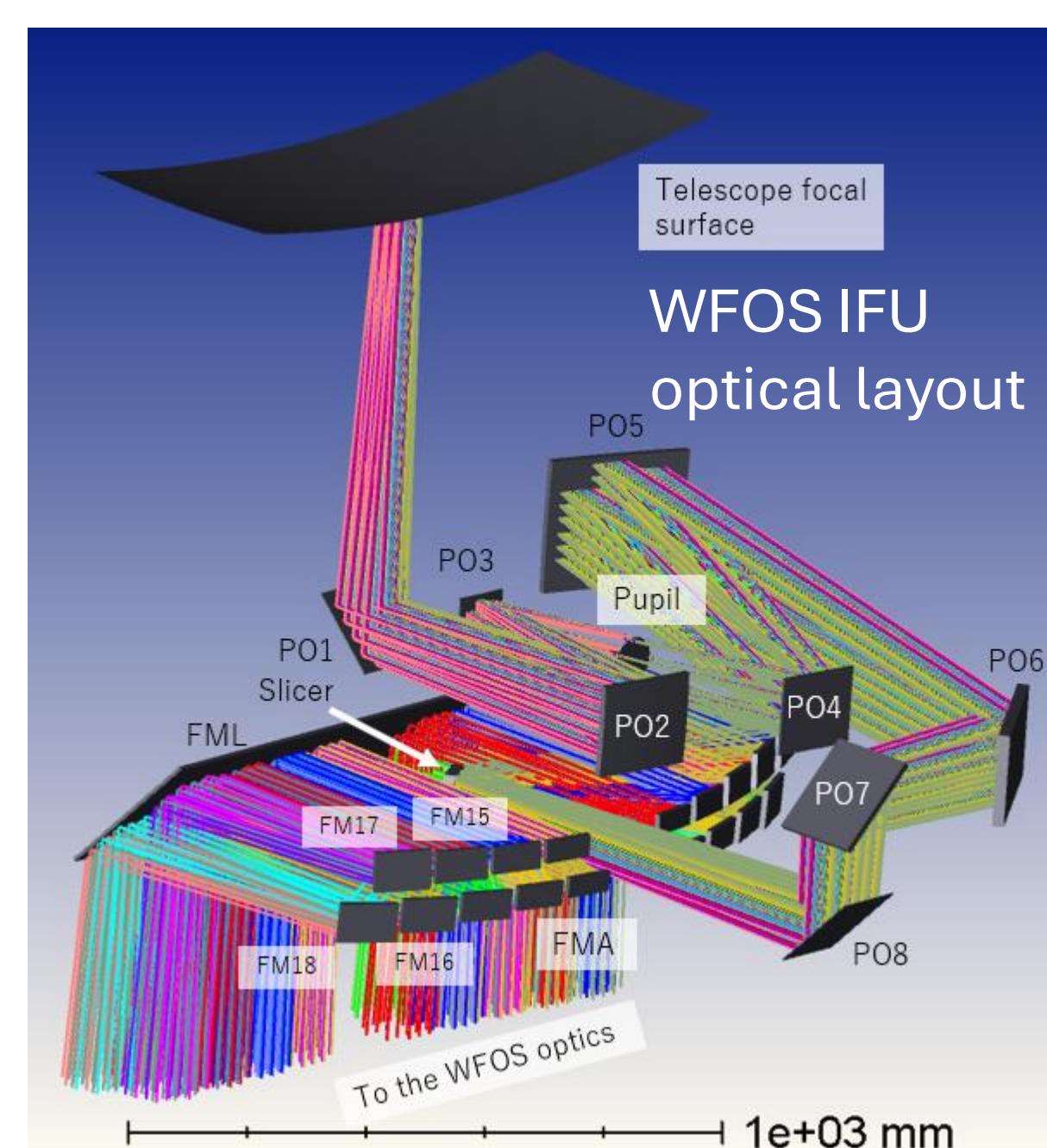
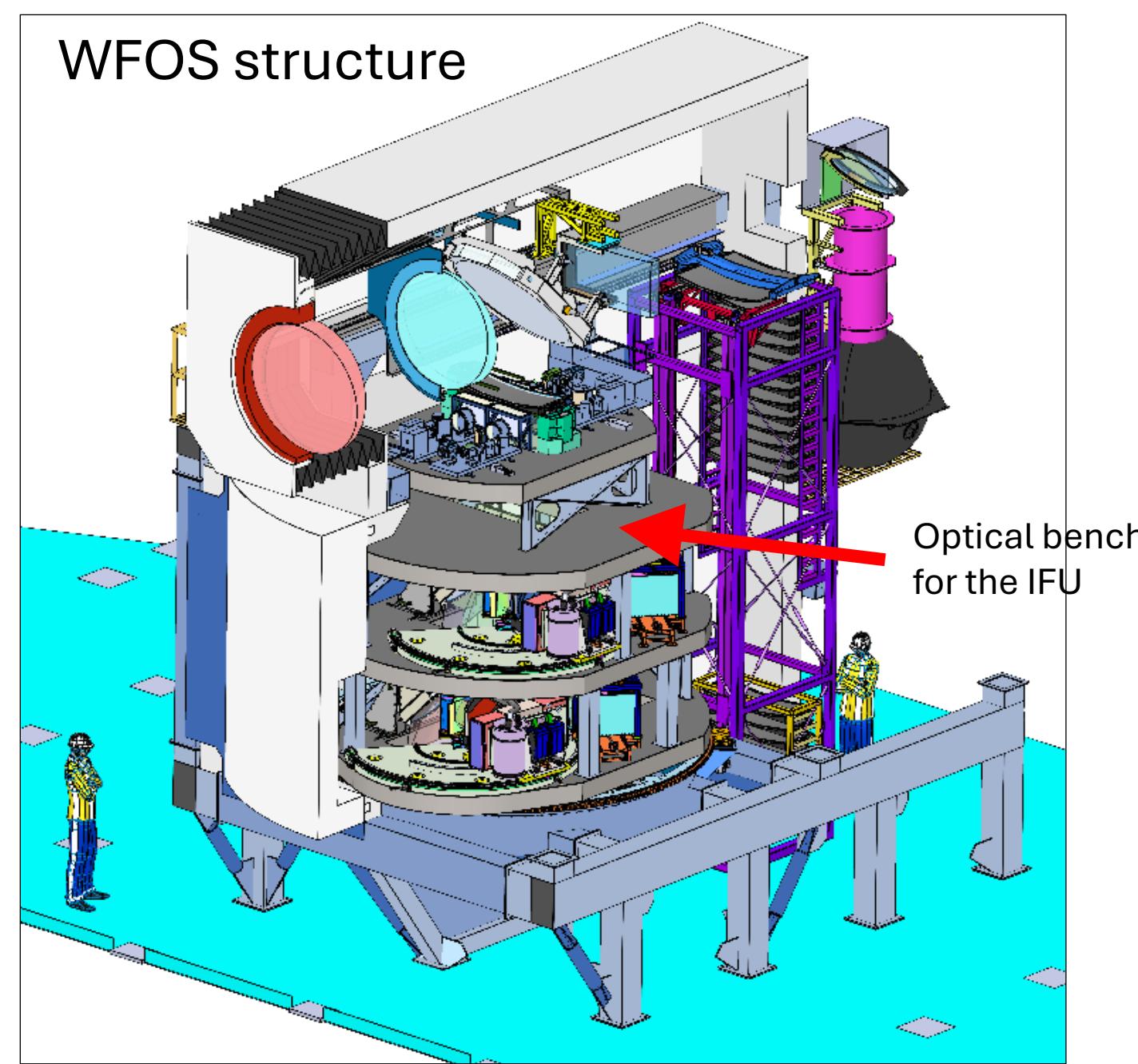
Tech. IFU: Technology verification for WFOS IFU

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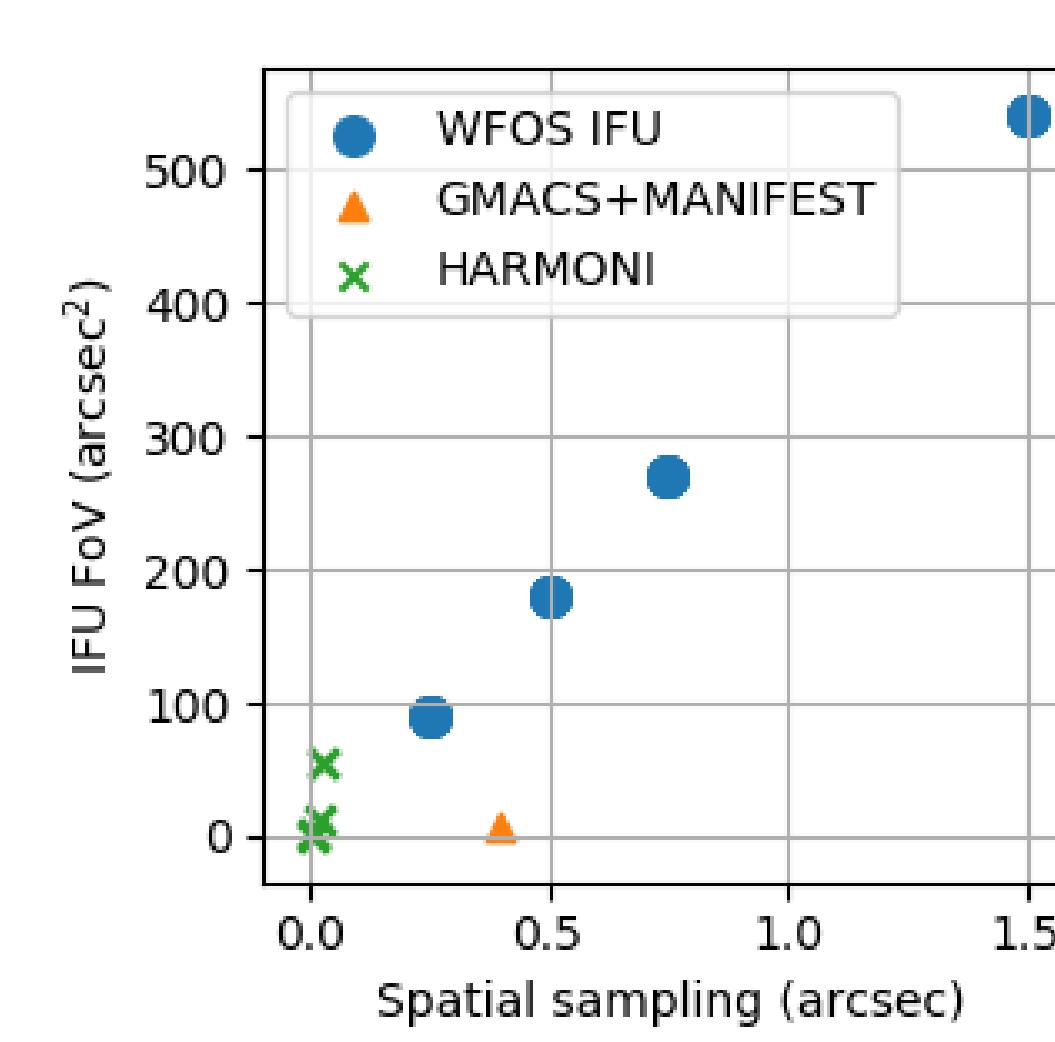
We are aiming to develop an IFU for Wide Field Optical Spectrograph (WFOS), one of the first-generation instruments of TMT, and now conducting some R&Ds on basic technologies for developing the IFU. To verify the technologies, we will develop an IFU (Tech. IFU) installed in FOCAS. In this presentation, we introduce Tech. IFU and its progress.

WFOS IFU

WFOS IFU is not a baseline feature of WFOS so far. However, In the review in this August, the reviewers recommended to include the IFU as part of the WFOS baseline design.

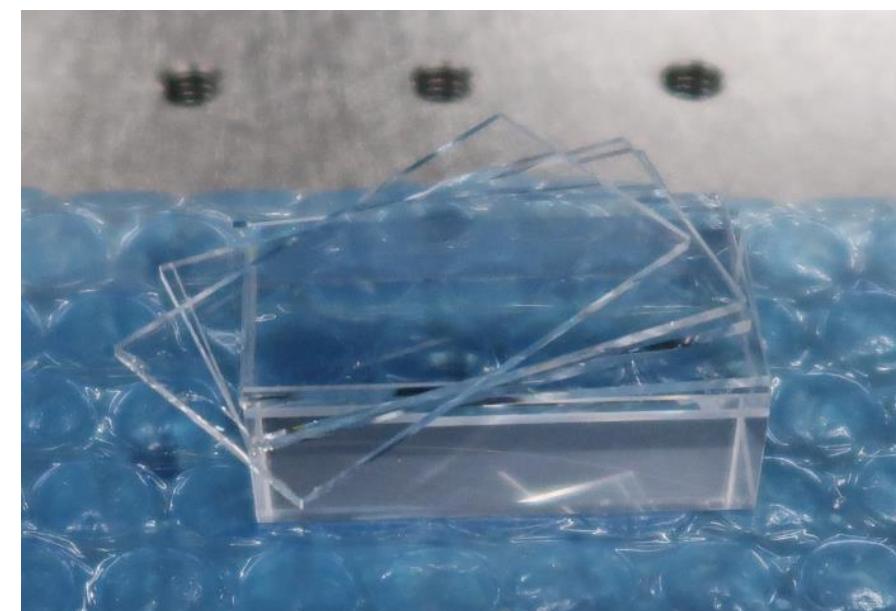


Number of slices	18			
Slice length (arcsec)	20			
Slice width (arcsec)	1.5	0.75	0.5	0.25
FoV (arcsec x arcsec)	20 x 27	20 x 13.5	20 x 9	20 x 4.5
Spectral resolution (R) for each grating in the IFU mode				
R=1500 grating	682	1364	2046	4092
R=3500 grating	1591	3182	4773	9546
R=5000 grating (goal)	2273	4545	6819	13635

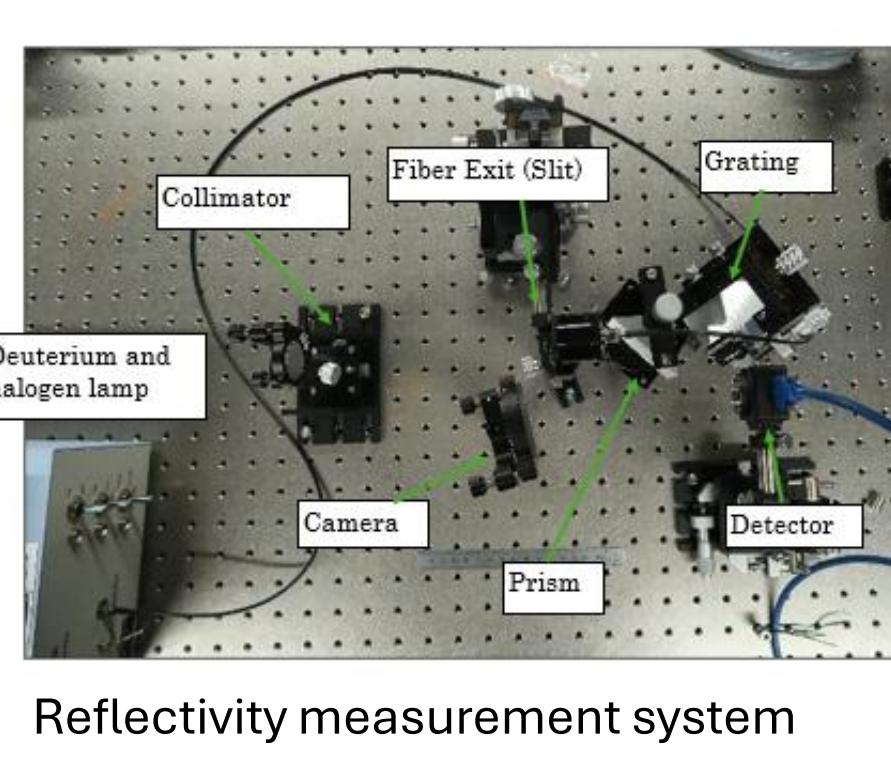
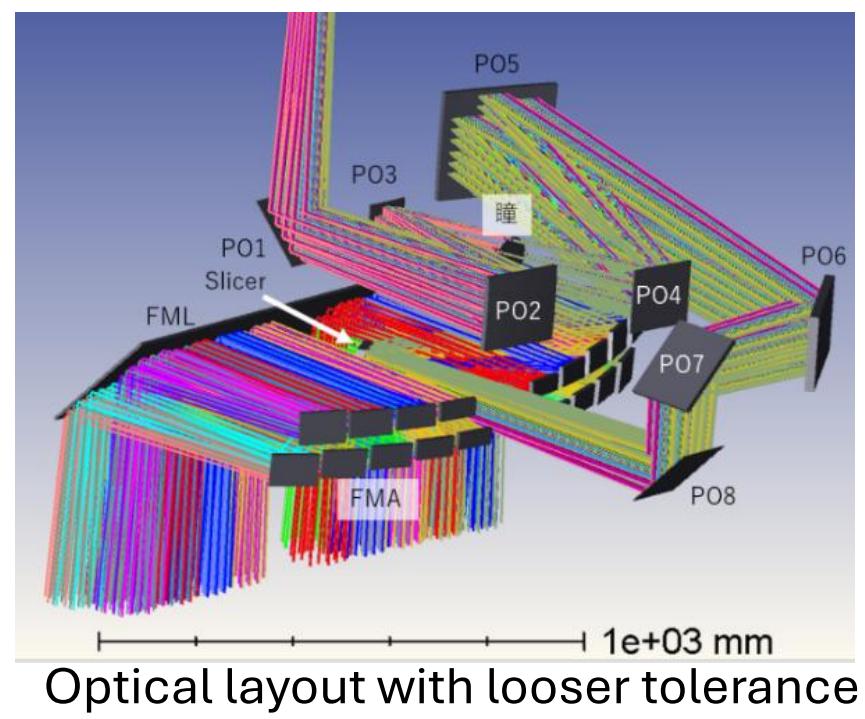


WFOS IFU has 4 slicers which have different slice widths. The wider width modes have outstandingly wider field comparing other IFUs on extremely large telescopes. In the narrowest width mode, the spectral resolution reaches R=13,635 without slit loss.

Project overview of Tech. IFU

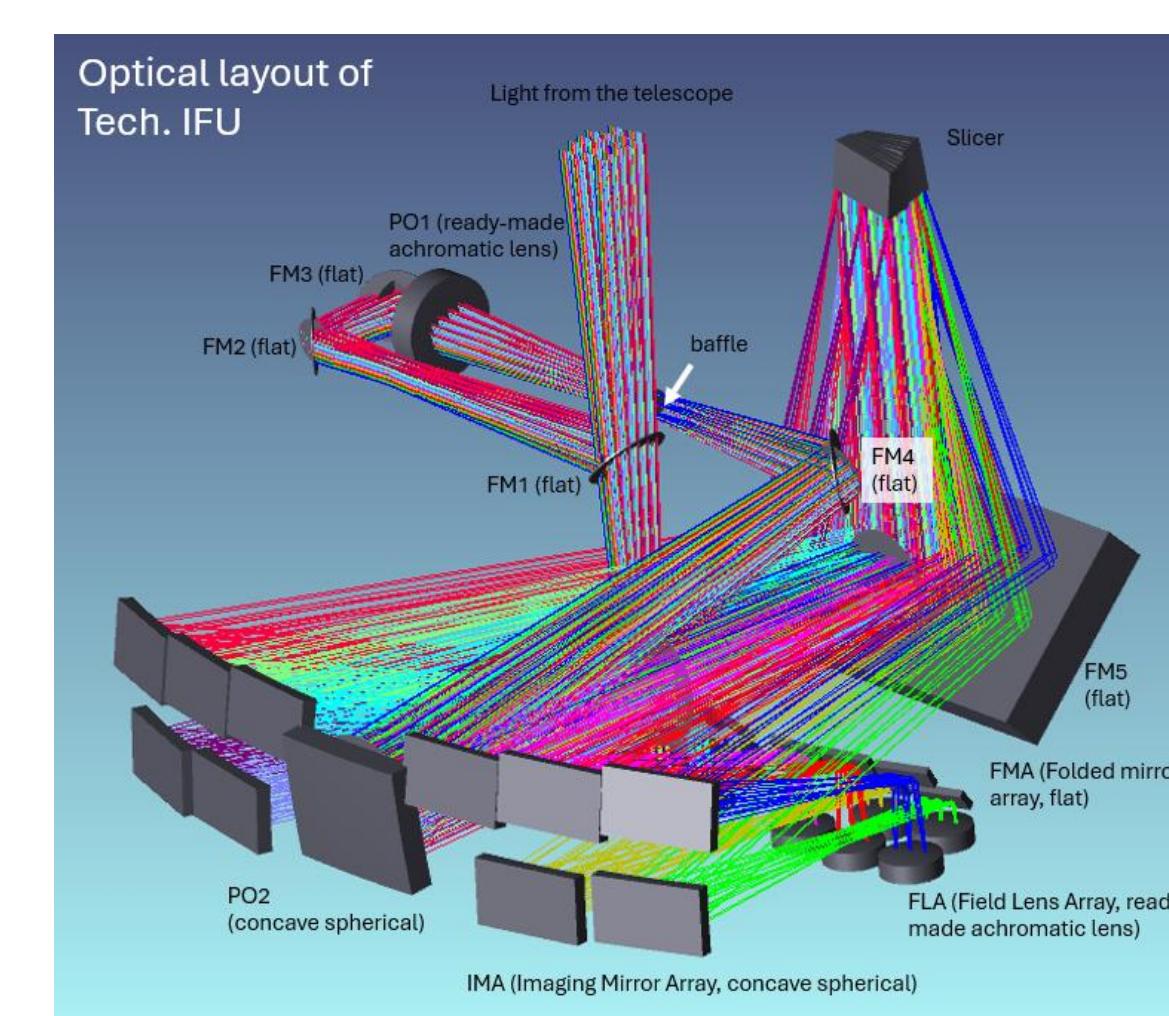
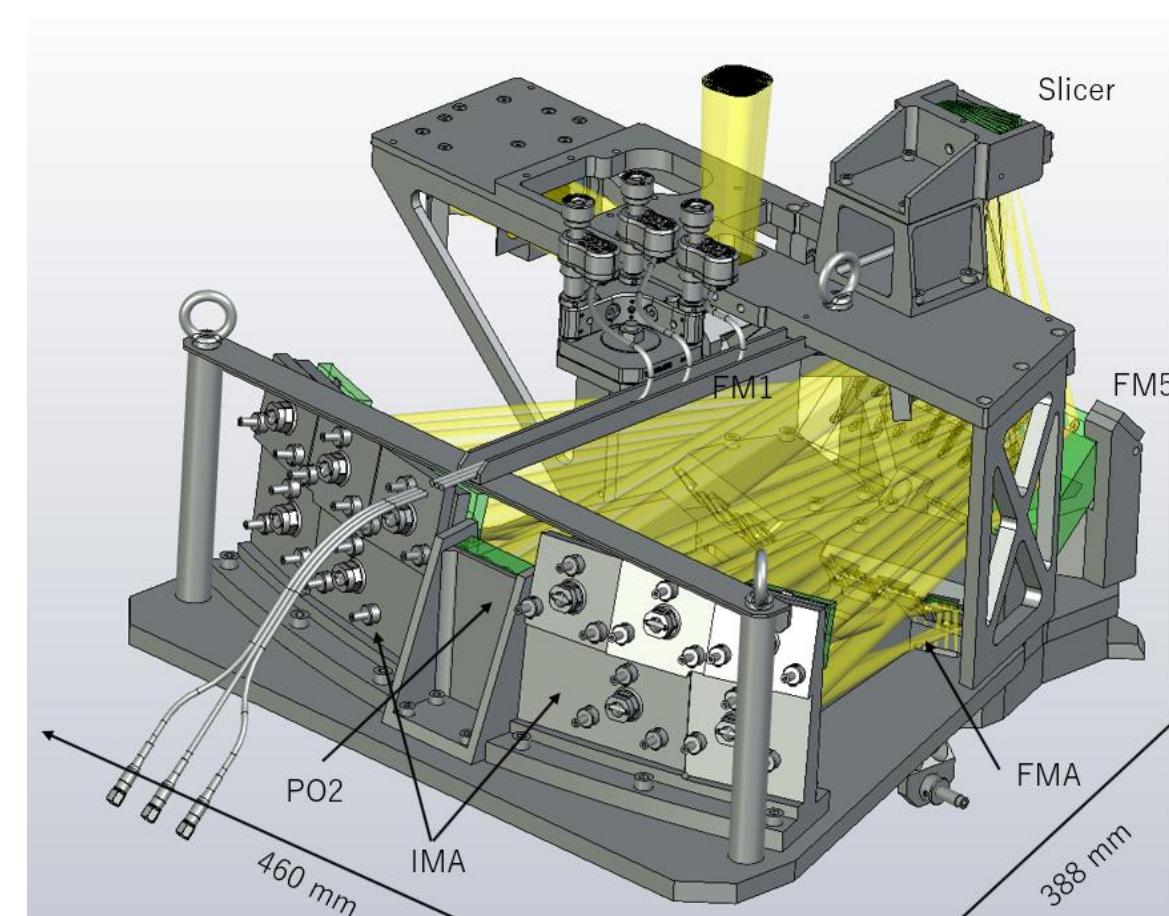
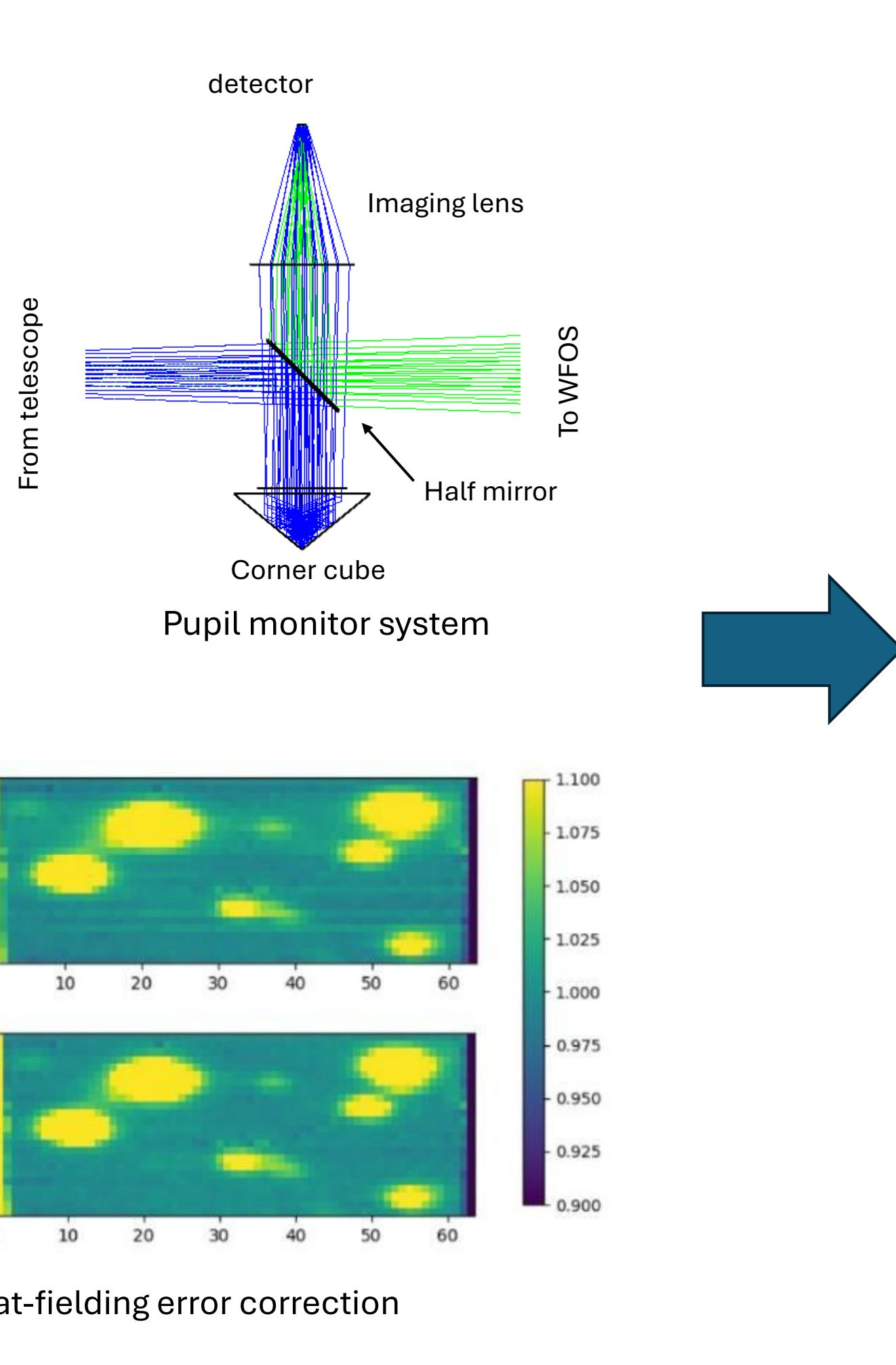


Improvement of the slicer assembling accuracy.

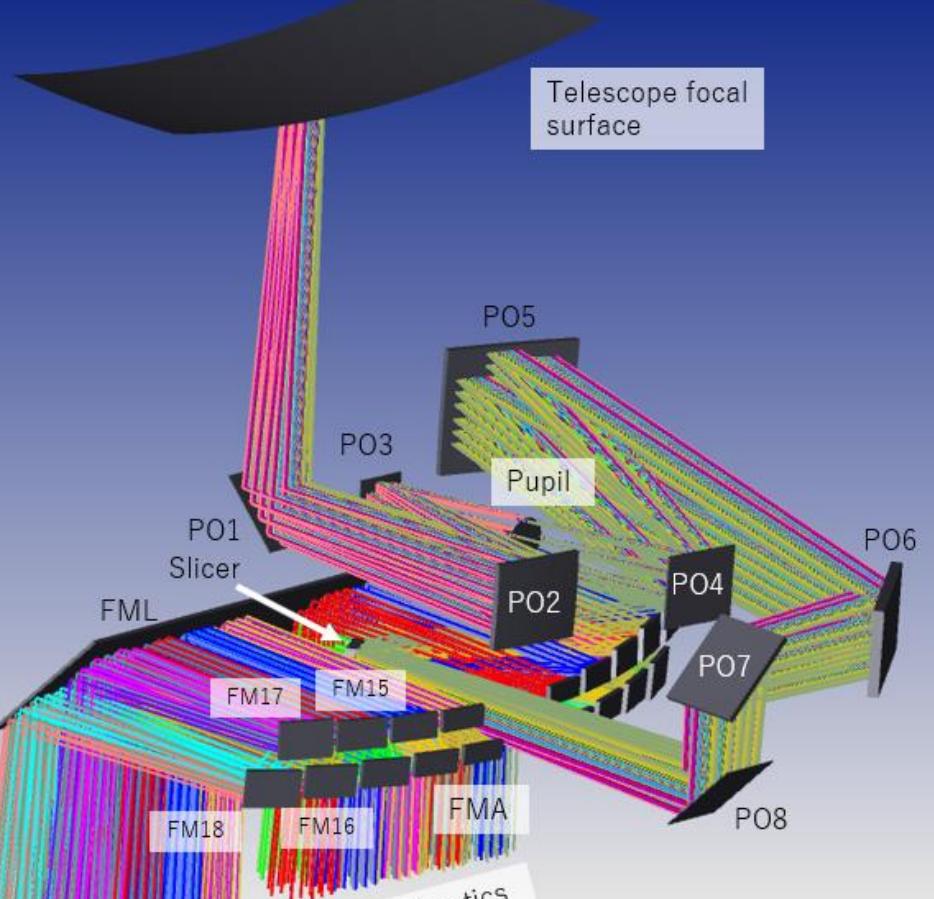
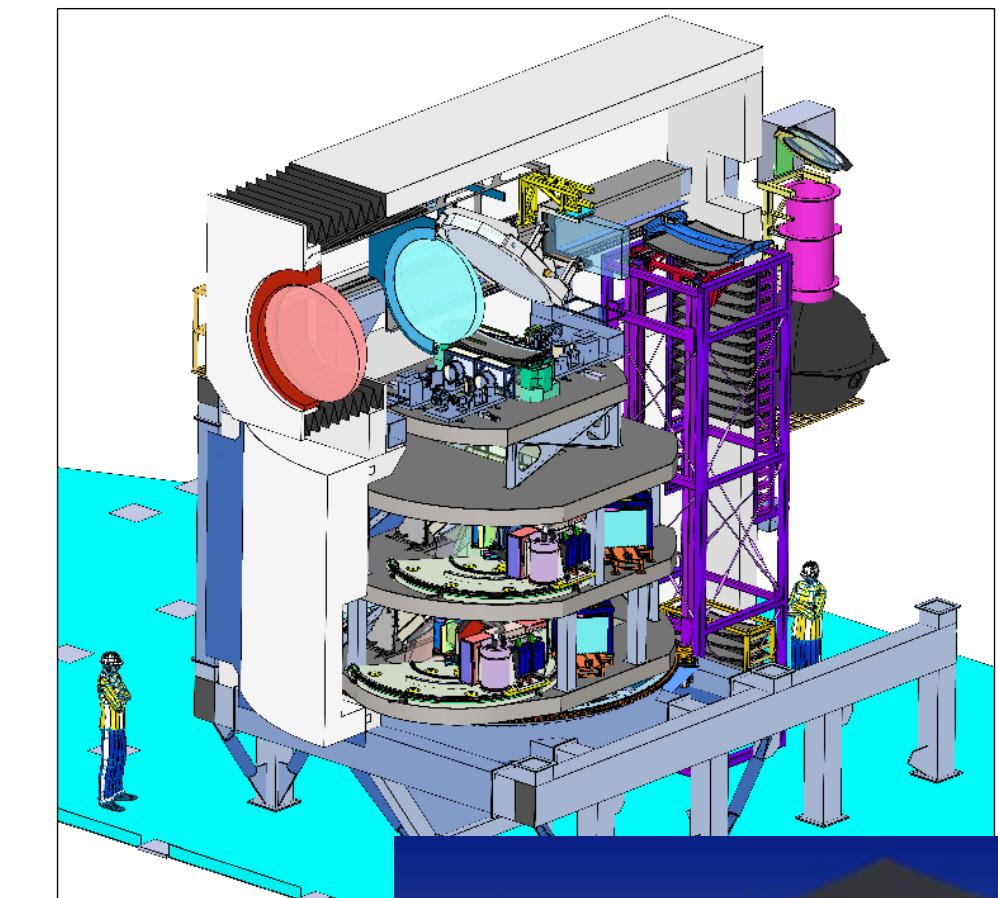


Reflectivity measurement system

We are now conducting some R&Ds toward WFOS IFU. Tech. IFU is a testbed for verifying the technologies obtained from the R&Ds and is installed in the optical imaging spectrograph, FOCAS, on the Subaru telescope.



Tech. IFU

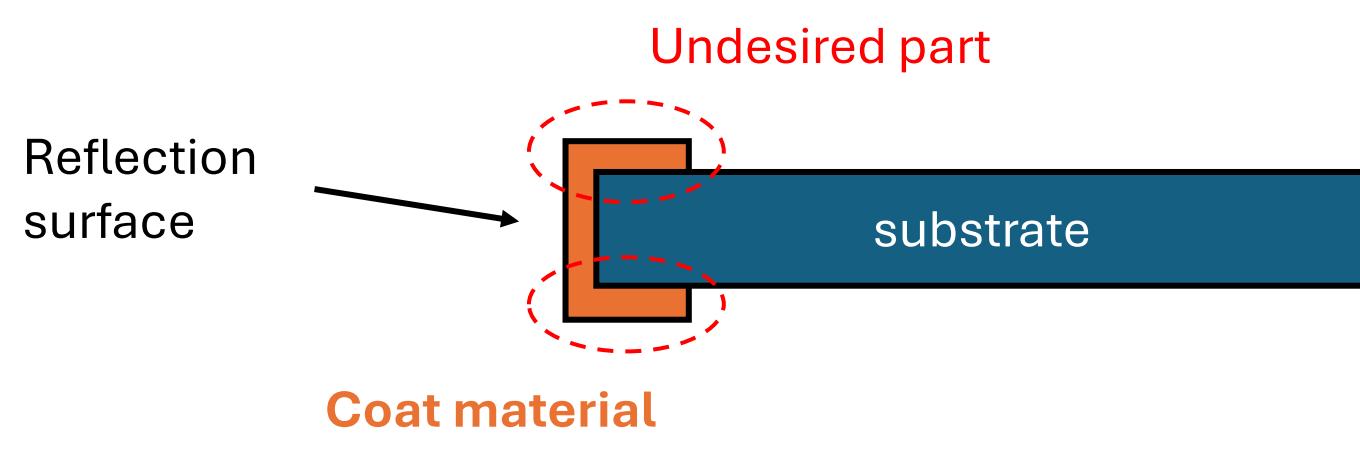


WFOS IFU

Progress since the last UM

Success of removing undesired coat material without damage on the reflection surface

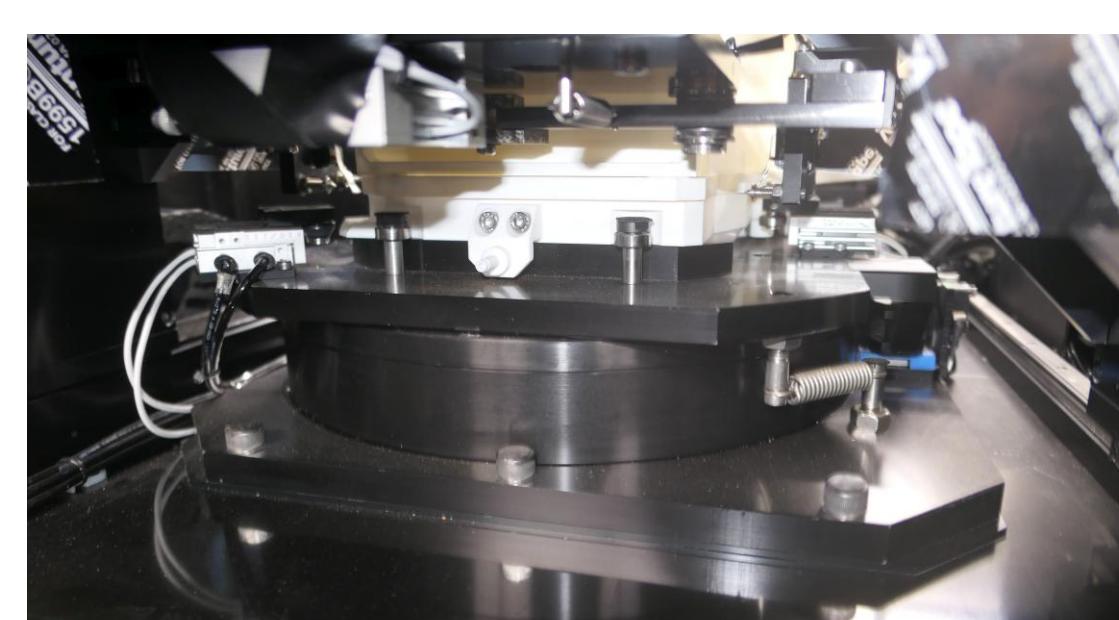
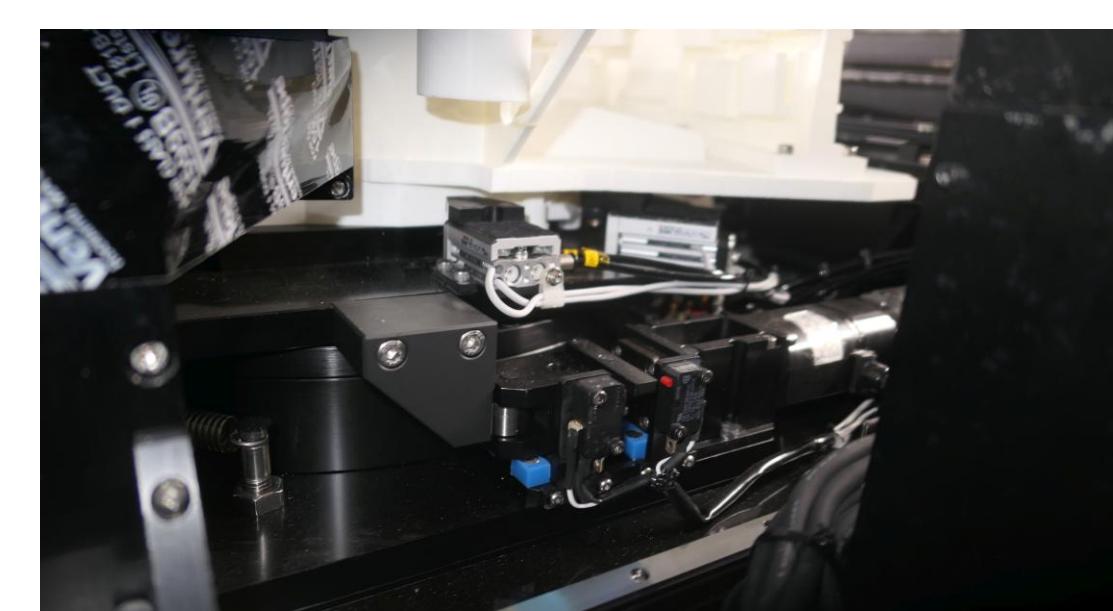
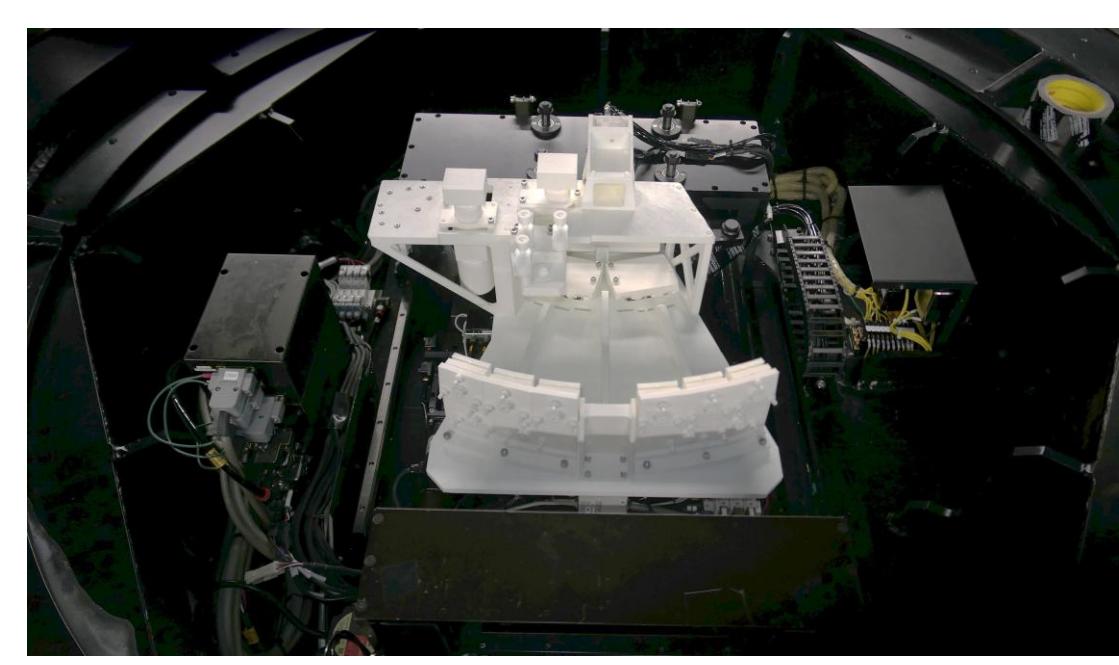
To achieve high throughput, we adopt all dielectric multi-layer coat for all reflection surfaces including the slice mirrors. Undesired parts of coat material causes assembly error, so their removal is crucial for slicer manufacturing.



Cross-sectional view of a slice mirror.

Fitting test using the 3D model

We confirmed there is no interference with the FOCAS structure. Thanks to the Subaru staff.



Coating test

All dielectric multilayer coat with high reflectivity and wide wavelength range tends to exhibit unexpected and narrow absorption features. We did not detect the unexpected absorption feature in the test coated sample.

