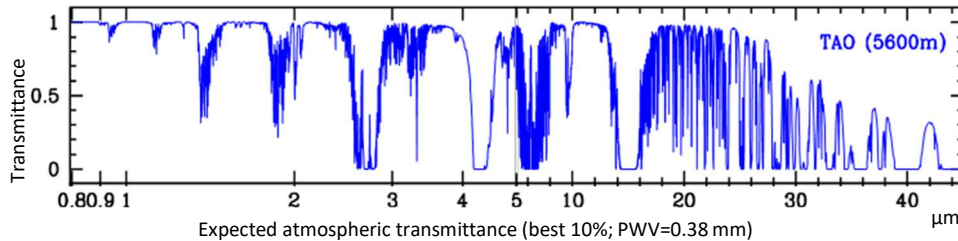


MIMIZUKU (Mid-Infrared Multi-field Imager for gaZing at the UnKnown Universe) is the mid-infrared imager and spectrograph for the University of Tokyo Atacama Observatory (TAO) 6.5-m telescope.

Key concepts are:

- 1) **Wide wavelength coverage (1-38 μm) including 30- μm wavelength range.**
- 2) **High spatial resolution achieving $\lesssim 1''$ in mid-infrared wavelengths.**
- 3) **Accurate monitoring with multi-field imaging/spectroscopy.**

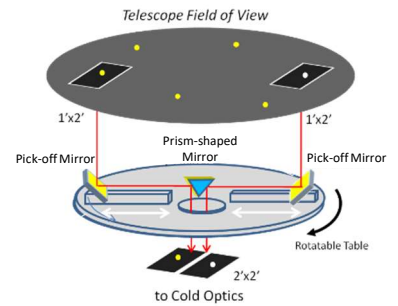


Specifications of MIMIZUKU

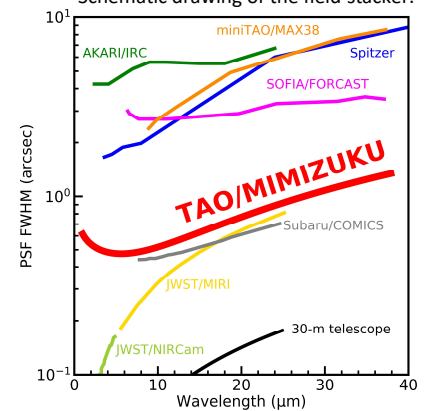
Channel	NIR	MIR-S	MIR-L
Observation Mode	Imaging & Spectroscopy		
Wavelength	1.0–5.3 μm	6.8–26 μm	24–38 μm
Detector	HgCdTe 1k	Si:As 1k	Si:Sb 128
Pixel Scale	0."069/pix	0."11/pix	0."24/pix
Field of View	Normal	1.2' \times 1.2'	2.0' \times 2.0'
	Multi-Field	1.2' \times 0.6' \times 2 fields	2.0' \times 1.0' \times 2 fields
Spatial Resolution	Seeing-limited (~0.5 arcsec)	Diffraction-limited (0.5–0.9 arcsec)	Diffraction-limited (0.9–1.3 arcsec)
Spectroscopy	KL-band: 2.0–4.0 μm , R=210	N-band: 7.0–13.5 μm , R=170	Currently, not available.
	LM-band: 2.7–5.3 μm , R=200	Q-band: 16.5–26.0 μm , R=110	
	2.7 μm -band: 2.40–2.98 μm , R=660		



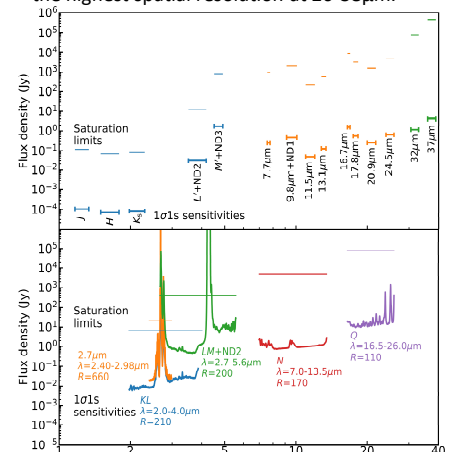
MIMIZUKU at Mitaka Lab. Dimensions are 2.0 \times 2.0 \times 2.1 m³. Weight is 2.5 tons.



Schematic drawing of the field stacker.



Spatial resolution of TAO/MIMIZUKU compared with other instruments. MIMIZUKU achieves the highest spatial resolution at 26–38 μm .



Expected sensitivity (thick lines) and saturation limits (thin lines) of TAO/MIMIZUKU.

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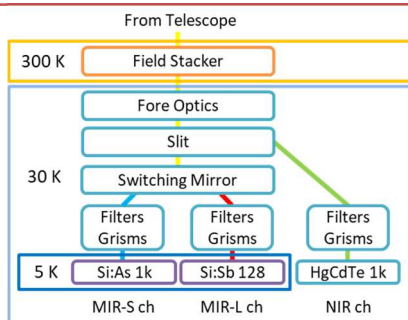


Diagram of the MIMIZUKU optics.

The field stacker is a newly invented optical unit to achieve accurate photometry in the mid-infrared wavelengths. It consists of two pick-off mirrors and a prism-shaped mirror. These are placed on a rotation table. The pick-off mirrors can also move along the radial direction of the rotation table, and pick off two separate fields in the telescope field-of-view. The picked-off beams are brought to the prism-shaped mirror, combined into a single beam, and then led to the cold optics.

Thus the field stacker enables us to observe two arbitrary fields, i.e., more than two stars simultaneously. It dramatically improves the accuracy, reliability, and feasibility of photometric and spectroscopic monitoring observations.

The optics of MIMIZUKU consists of warm optics called Field Stacker and cold optics. The cold optics have three optical channels with three different detectors. The MIR-S channel has a 1k-format Si:As array, which covers 6.8–26 μm . The MIR-L channel has a 128-pix-format Si:Sb array covering 24–38 μm . The NIR channel covers 2.0–5.3 μm with a 1k-format MCT array.