

FLITECAM: First Light Infrared Test Experiment CAMera

Facility Class, Near-Infrared Camera and Spectrograph

Principal Investigator: Ian McLean, University of California Los Angeles

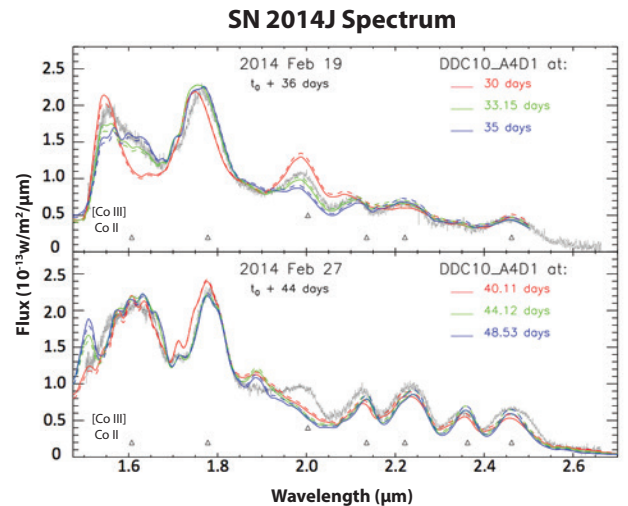
SN 2014J Entire Feature Profile

FLITECAM observed the H + K-band spectrum on Feb 19, 2014 and Feb 27, 2014 with strong emission features at 1.55-1.65 μm and 1.77 μm . The detail of the geometry of the 1.77 μm emission peak has enabled it to be identified as permitted lines of Co II and not a blend of Fe group lines and Co II as previously believed. The strongest emission lines of Co II and [Co III] are presented in the bottom of each plot and triangles indicate the locations of lines predicted to be strong in the model for comparison.

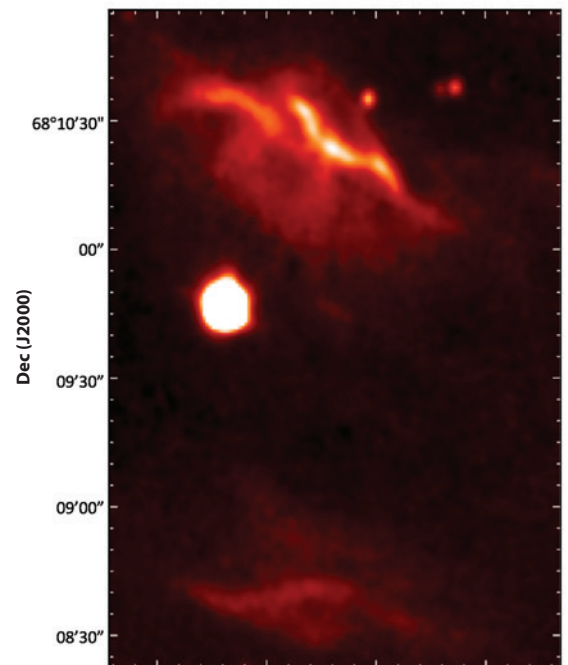
Favorable atmospheric transmission achievable in the stratosphere onboard SOFIA has enabled FLITECAM spectra to be the only data collected on SN 2014J that spans the entire feature profile. (Vacca, W. D. et al., 2015, ApJ, 804, 66.)

PAH Filter Observation at 3.3 μm

A 3.3 μm polycyclic aromatic hydrocarbon (PAH) filter was used to study the photochemical evolution of PAHs in the reflection nebula NGC 7023. The filter is narrow, $\Delta\lambda=0.09 \mu\text{m}$, and isolates the PAH emission. The plate scale is 0.475 arcsec/pixel and the angular resolution is about 2 arcsec, dominated by telescope jitter. FORCAST also performed observations of NGC 7023 (at 11.2 μm) and the combined data shows a peak in the 11.2/3.3 μm ratio, corresponding to PAHs of ~ 50 C-atoms. This supports models claiming the photochemical evolution of PAHs is size-dependent and most efficient for PAHs with ~ 50 C-atoms. (Croiset et al. 2016, A&A, 590, A26.)



NGC 7023 at 3.3 μm





Specifications

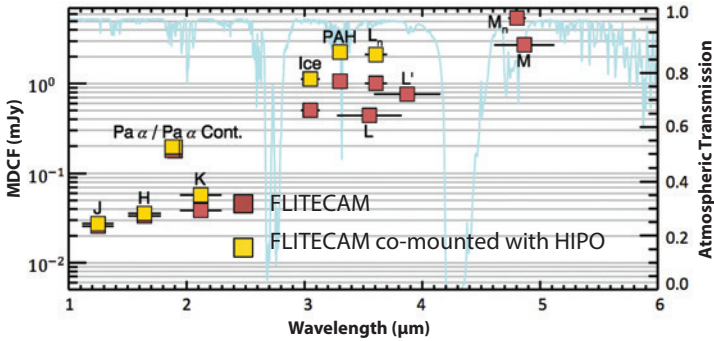
Imaging

FLITECAM consists of a cryogenically cooled near-IR camera operating and uses refractive optics with the specifications below.

Detector Information

Field of View	Detector Array	λ Range
~8' diameter	1024x1024 InSb	1.0–5.5 μm
	0.475" x 0.475" pixels	

FLITECAM Imaging Sensitivity



Cycle 4 theoretical continuum point source sensitivities for a S/N of 4 in 900 s at partial water vapor (PWV) overburdens of 7 μm . Horizontal bars correspond to the photometric band pass.

Filter Parameters

Passband	λ_{eff} (μm)	5%BW ^a (μm)
Standard Filters		
J	1.24	0.29
H	1.63	0.31
K	2.10	0.40
L	3.53	0.65
L'	3.86	0.70
Specialty Filters		
Pa α	1.87	0.03
Pa α Cont.	1.90	0.03
H ₂ O Ice	3.05	0.19
PAH	3.30	0.12
L _{narrow}	3.61	0.23
M _{narrow}	4.80	0.19
Order Sorting Filters		
H _{wide}	1.79	0.59
K _{wide}	2.30	0.88
K _{long}	2.45	0.55
L+M	4.11	2.72

^aBandwidth for transmission level is >5%.

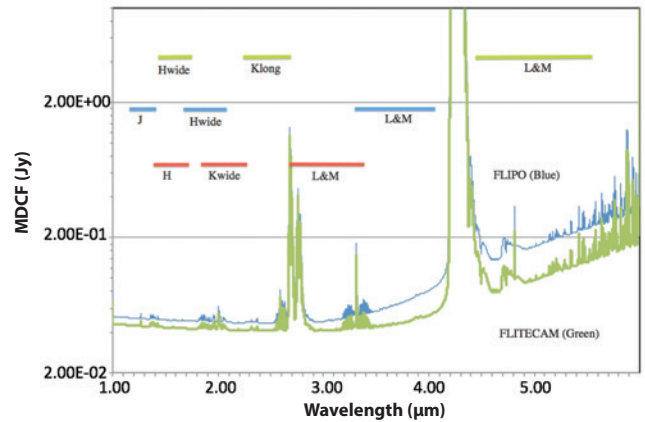
Spectroscopy

The instrument has a set of broadband filters for imaging (*top right*), as well as gratings for moderate resolution spectroscopy (*below*).

Grism Characteristics

Grism	Order Sorting Filters	Coverage (μm)	R ($\lambda/\Delta\lambda$)	
			High-res	Low-res
A	L+M	4.40–5.53	—	—
	K _{long}	2.27–2.72	1690	1140
	H _{wide}	1.55–1.83	1710	1290
B	L+M	3.30–4.07	1780	1200
	H _{wide}	1.68–2.05	1750	1320
	J	1.14–1.39	1720	1425
C	L+M	2.78–3.40	1670	1300
	K _{wide}	1.91–2.28	1650	1390
	H	1.50–1.72	1640	1400

Grism Sensitivities



FLITECAM (green) and FLIPO (blue) grism continuum point source sensitivities across FLITECAM bandpasses.

