



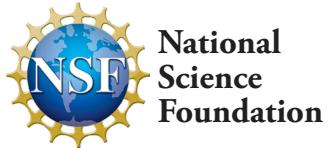
DKIST First Light Instrument Capabilities



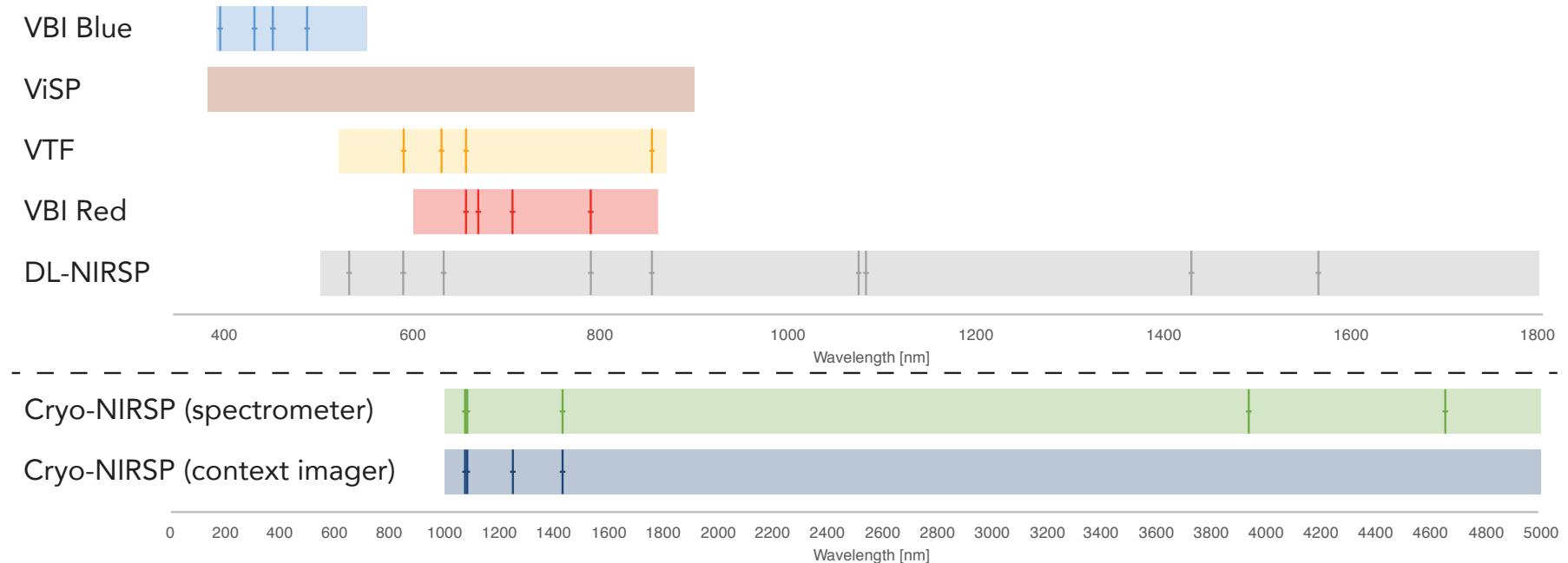
	Instrument type	Spectral range	Spectral resolution	Spatial sampling	Maximum Instantaneous Field of View	Maximum Sampled Field of View	Peak Cadence	Analogous Instruments
Visible Broadband Imager VBI (Blue)	High Cadence, High Resolution Imager	390-550nm (sequential filter sequencing)	N/A	0.011"	45" x 45"	2' x 2' (sequential field sampling)	3.2 sec (reconstructed) 0.03 sec (raw images)	ROSA, Hinode/BFI High cadence, high spatial resolution
Visible Spectropolarimeter ViSP	Scanning Slit Spectropolarimeter	380-900nm (3 spectral windows at a time)	>180,000	0.0195" (arm 1) 0.0236" (arm 2) 0.0295" (arm 3) [sampling along slit]	5 slits Width x Length 0.028" or 0.041" or 50" (arm 1) 0.053" or x 60" (arm 2) 0.106" or 75" (arm 3) 0.214"	Slit length x 2'	0.5-10 sec per slit position (polarimetry) 0.02-0.2 sec per slit position (intensity-only)	SPINOR, Hinode/SP, IRIS, GRIS Scanning spectrograph, high spectral fidelity
Visible Tunable Filter VTF	Fabry Perot Imaging Spectropolarimeter	520-870nm (sequential scans through multiple spectral lines)	FWHM 6-8 pm	0.014"	60" x 60"	60" x 60"	Typical scan times per spectral line: 0.5-2 s (intensity only); 2-10 s (polarimetry)	IBIS, CRISP, GFPI Imaging spectropolarimeter
Visible Broadband Imager VBI (Red)	High Cadence, High Resolution Imager	600-860nm (sequential filter sequencing)	N/A	0.017"	69" x 69"	2' x 2' (sequential field sampling)	3.2 sec (reconstructed) 0.03 sec (raw images)	ROSA, Hinode/BFI High cadence, high spatial resolution
Diffraction Limited Near Infrared Spectropolarimeter DL-NIRSP	Integral Field Unit Spectropolarimeter	500-900nm 900-1350nm 1350-1800nm (1 filter band per channel)	125,000	0.03" (high res) 0.077" (mid res) 0.464" (wide field)	2.4" x 1.8" (high res) 6.16" x 4.62" (mid res.) 27.84" x 18.56" (wide)	2' x 2'	Depends on resolution and total field of view. E.g. 6s for one tile, on-disk, high resolution, full polarimetry	SPIES True Imaging Spectropolarimeter: simultaneous 2D FOV and spectral information using fiber-fed IFU
Cryogenic Near Infrared Spectropolarimeter Cryo-NIRSP	Scanning Slit Spectropolarimeter	1000-5000nm (1 filter band at a time. About 70 s to switch filters)	100,000 on-disk 30,000 off-limb	0.12" [along slit] (no Adaptive Optics)	2 slits 0.15" x 120" slit 0.5" x 240" slit	4' x 3' (near limb) 5' round (off-limb)	Heavily depends on signal to noise. Maximum frame rate is 10 frames per second e.g. 1s per slit position near-limb/chromosphere	CYRA (BBSO) Cryogenic, scanning spectrograph, novel diagnostics
Cryo-NIRSP Context Imager	Imager	1000-5000nm (1 filter band at a time, with fast switching time to support sequential observations during a single-band spectrograph scan.)	N/A	0.052" (no Adaptive Optics)	100" x 100"	4' x 3' (near limb) 5' round (off-limb)	Heavily depends on signal to noise. Maximum frame rate is 10 frames per second e.g. 1s per slit position near-limb/chromosphere	CYRA (BBSO) Cryogenic, scanning spectrograph, novel diagnostics

This table is meant to give an idea of the capabilities of the DKIST first light instrument suite. It cannot capture the large trade space that is provided by the flexibility of the instruments. For more information, visit <http://dkist.nso.edu/CSP/instruments>





DKIST First Light Instrument Filters



VBI Blue		ViSP		VTF		VBI Red		DL-NIRSP		Cryo-NIRSP		Cryo Context	
Ca II K	393.327nm	Access to entire spectral range between 380-900 nm		Na D	589.6nm	H-alpha	656.282nm	Fe XIV	530.3 nm	Fe XIII	1074.7nm	Fe XIII	1074.7nm
G-band	430.52nm			Fe I	630.25nm	Continuum	668.423nm	He I	587.6 nm	Fe XIII	1079.7nm	He I	1083nm
Continuum	450.287nm			H-alpha	656.3nm	Ti O	705.839nm	Fe XI	630.2 nm	He I	1083 nm	J Band	1250nm
H-beta	486.1nm			Ca II	854.2nm	Fe XI	789.186nm	Ca II	789nm	Si X	1430nm	Si IX	1430nm
								Fe XIII	854.2nm	Si IX	3935 nm		
								He I	1083nm	CO	4651nm		
								Fe I	1565nm				

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Visible light cameras for instruments are provided by a UK consortium.

