

DKIST Critical Science Plan Workshop #10 (5b):
Wave generation and propagation

Critical Science Plan and Science Use Cases

[DKIST Critical Science Plan \(CSP\)](#)

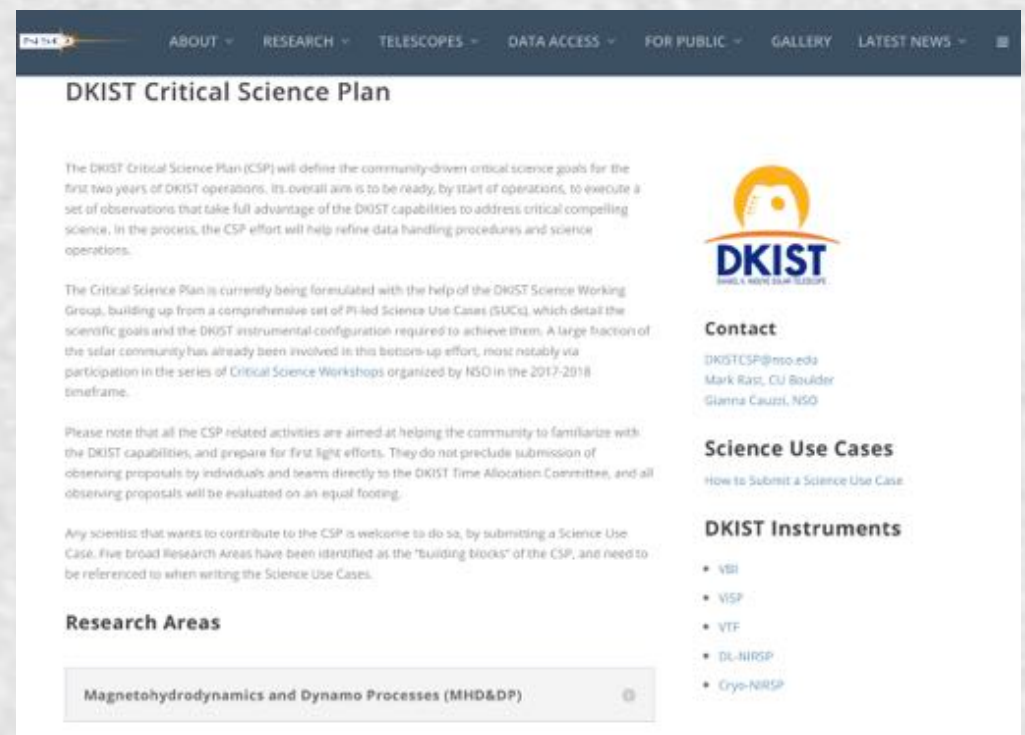
Aim: To be ready *as a community*, by science first light, to execute a set of observations exploiting the DKIST capabilities to address critical, compelling science in the first two years of operations (nominally 2020, 2021).

Bottom-up approach, community based. Workshops one of the tools, but NOT exclusive

<https://www.nso.edu/telescopes/dkist/csp/>

Critical Science Plan Structure:

- Research Areas
- Research Topics
- Science Use Cases



DKIST Critical Science Plan

The DKIST Critical Science Plan (CSP) will define the community-driven critical science goals for the first two years of DKIST operations. Its overall aim is to be ready, by start of operations, to execute a set of observations that take full advantage of the DKIST capabilities to address critical compelling science. In the process, the CSP effort will help refine data handling procedures and science operations.

The Critical Science Plan is currently being formulated with the help of the DKIST Science Working Group, building up from a comprehensive set of PI-led Science Use Cases (SUCs), which detail the scientific goals and the DKIST instrumental configuration required to achieve them. A large fraction of the solar community has already been involved in this bottom-up effort, most notably via participation in the series of Critical Science Workshops organized by HSO in the 2017-2018 timeframe.

Please note that all the CSP related activities are aimed at helping the community to familiarize with the DKIST capabilities, and prepare for first light efforts. They do not preclude submission of observing proposals by individuals and teams directly to the DKIST Time Allocation Committee, and all observing proposals will be evaluated on an equal footing.

Any scientist that wants to contribute to the CSP is welcome to do so, by submitting a Science Use Case. Five broad Research Areas have been identified as the "building blocks" of the CSP, and need to be referenced to when writing the Science Use Cases.

Research Areas

- Magnetohydrodynamics and Dynamo Processes (MHD&DP)

Contact

DKISTCSP@nso.edu
Mark Rast, CU Boulder
Gianna Cauzi, NSO

Science Use Cases

How to Submit a Science Use Case

DKIST Instruments

- VSI
- VSP
- VTF
- DL-NIRSP
- Cryo-NIRSP

DKIST Critical Science Plan (CSP)

As a community we must:

- understand forthcoming capabilities
- define science goals
- compile Science Use Cases – write CSP document (SWG)
- complete Science Use Cases
- coordinate to form a complementary set of PI lead teams
- convert Science Use Cases into PI led Observing Proposals

This will enable:

- Service Mode observations
- Scientific analysis
- PI led publication of first-light results

[At this workshop:](#)

Develop a set of well defined, complementary **Science Use Cases**, detailing the topics to be investigated, the reasons why DKIST is necessary, and the type of DKIST observations necessary to address the science.

1. Formulate science context and goals; specify *why* DKIST
2. Identify observational needs (spectral lines of interest, pattern, cadence, sensitivities)
3. Determine useful DKIST instrument suite
4. Assess instrument performance capabilities

<http://nso-atst.atlassian.net/>

Collaborative JIRA environment for Science Use Case development

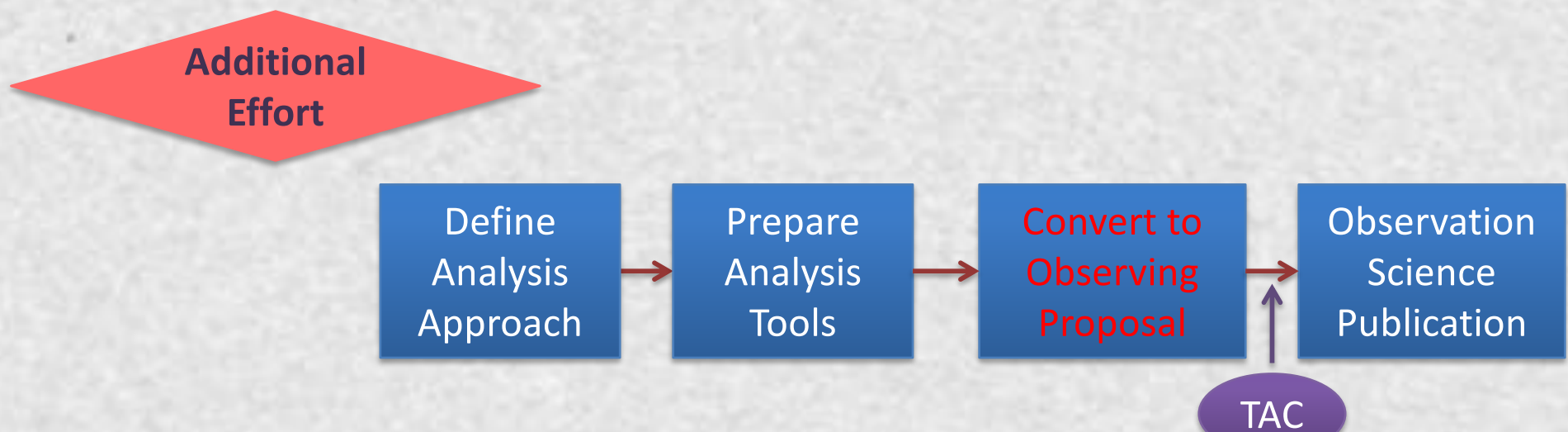
If you do not yet have an account, **email an account request to:**

DKISTCSP@nso.edu

Science Use Cases provide feedback to DKIST. The existing (and future) Science Use Cases will inform the project about:

- Science most relevant to the community;
- Instruments, lines, modes of operation most requested (desired?) by the community;
- Allow definition of efficient operation, data management

After this workshop: Conversion of Science Use Case to Observing Proposal



<https://www.nso.edu/telescopes/dkist/csp/>

- Critical science description (living document) with links to Science Use Case titles and abstracts, and ultimately their full text
- Links to Instrument and other summary documents
- Links to beam-splitter configuration and data rate analysis tool (FIDO)

NOTE: Links to ALL documents, FIDO tool, and IPCS can be found at <https://www.nso.edu/telescopes/dkist/csp/docs/>

<http://nso-atst.atlassian.net/>

Collaborative JIRA environment for Science Use Case development, and ultimately Observing Proposal development

<https://www.dropbox.com/sh/uzwdc03ayovxr5o/AABuZbWtCnfPqG8F2zHaeCFta?dl=0>

Dropbox link with summary documents (Instruments, Data Handling System (DHS), Facility Instrument Distribution Optics (FIDO), JIRA User's guide), and Instrument Performance Calculators (IPCs)

At this workshop:

Compile a set of well defined, complementary **Science Use Cases**, detailing the topics to be investigated, the reasons why DKIST is necessary, and the type of DKIST observations necessary to address the science.

1. Formulate science context and goals; specify *why* DKIST
2. Identify observational needs (spectral lines of interest, pattern, cadence, sensitivities)
3. Determine useful DKIST instrument suite
4. Assess instrument performance capabilities

Determine useful DKIST instrument suite

DKIST Instrument Summary Table

<https://www.nso.edu/telescopes/dkist/csp/docs/>

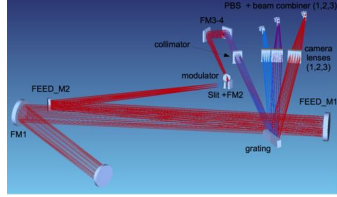
	Instrument type	Spectral range	Spectral resolution	Spatial sampling	Maximum Instantaneous Field of View	Maximum Sampled Field of View	Peak Cadence	Analogous Instruments
Visible Broadband Imager <i>VBI (Blue)</i>	High Cadence, High Resolution Imager	390-550nm (sequential filter sequencing)	N/A	0.011"	45" x 45"	2' x 2' (sequential field sampling)	3.2 sec (reconstructed) 0.03 sec (raw images)	ROSA, Hinode/BFI <i>High cadence, high spatial resolution</i>
Visible Spectropolarimeter <i>VISP</i>	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 0.053" or 0.106" or 0.214" 50" (arm 1) 60" (arm 2) 75" (arm 3)	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 <i>Scanning spectrograph, high spectral fidelity</i>
Visible Tunable Filter <i>VTF</i>	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 <i>Imaging spectropolarimeter</i>
Visible Broadband Imager <i>VBI (Red)</i>	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 <i>High cadence, high spatial resolution</i>
Diffraction Limited Near Infrared Spectropolarimeter <i>DL-NIRSP</i>	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 <i>True Imaging Spectropolarimeter: simultaneous 2D FOV and spectral information using fiber-fed IFU</i>
Cryogenic Near Infrared Spectropolarimeter <i>Cryo-NIRSP</i>	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) <i>Cryogenic, scanning spectrograph, novel diagnostics</i>
Cryo-NIRSP <i>Context Imager</i>	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) <i>Cryogenic, scanning spectrograph, novel diagnostics</i>

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>

Instrument Summary Documents:

Visible Spectro-Polarimeter (ViSP):

(PI: Roberto Casini, High Altitude Observatory)
(IS: Alfred de Wijn, High Altitude Observatory)



The ViSP is a slit spectrograph that will provide precision measurements of the full state of polarization (intensity plus a full description of the linear and circular polarization states) simultaneously at diverse wavelengths in the visible spectrum. It stresses spectral flexibility, has multiline capability, and will fully resolve the profiles of lines over a wide range of wavelengths.

Spatial Field of View and Resolution:

Optical: 2×2 arcmin² (of the the full 2.8 arcmin diameter round post-AO DKIST field of view)
Along slit: 0.0295/0.0236/0.0195 arcsec sampling for arm 1, 2, and 3, respectively (@ 617.3 nm)
Slit widths: 0.028 (diffraction limited at 900 nm), 0.041, 0.054, 0.107, 0.214 arcsec.
FOV height: Camera arm 1: 75 arcsec, Camera arm 2: 60 arcsec, Camera arm 3: 50 arcsec (@ 617.3 nm)

Sampling along slit is critical at about 920 nm, 745 nm, and 620 nm, for arm 1, 2, and 3, respectively
(e.g. $1.22 \lambda / D = 1.22 * 620e-9 / 4 * 206264.81 / 2 = 0.0195''$)

The ViSP uses co-aligned images from VBI Blue for context

Spectral Range and Resolution:

Range: 380 – 900 nm
with continuous spectral coverage over this range. Up to three spectral bands (about 1nm wide at 630 nm) can be observed simultaneously; any portion of the spectrum can be imaged individually on any of the 3 spectral arms.

Resolution: better than 3.5 pm (1.75 pm sampling) at 630 nm ($R > 180000$)

Example photospheric and chromospheric lines accessible:

1. Ca II K	393.37 nm	(photo/chromosphere)	16. Na I D2	589.00 nm	(photo/chromosphere; PRD)
2. Ca II H	396.85 nm	(photo/chromosphere)	17. Na I D1	589.59 nm	(photo/chromosphere; PRD)
3. Fe I	404.58 nm	(photosphere)	18. Fe I	617.33 nm	(HMI)
4. H δ	410.17 nm	(E-field diagnostics)	19. Fe I	630.20 nm	(Hinode/SP)
5. Ca I	422.67 nm	(PRD)	20. H α	656.28 nm	(chromosphere)
6. H γ	434.05 nm	(E-field diagnostics)	21. Ni I	676.78 nm	(photosphere)
7. Ti I	453.60 nm	(second solar spectrum)	22. Ca I	714.82 nm	(photosphere)
8. Ba II	455.40 nm	(second solar spectrum)	23. Fe I	751.15 nm	(photosphere)
9. Sr I	460.73 nm	(Hanle effect)	24. K I	769.90 nm	(photosphere)
10. H β	486.13 nm	(chromosphere)	25. Na I	818.33 nm	(photo/chromosphere)
11. Mg I b1	517.27 nm	(photo/chromosphere)	26. Na I	819.48 nm	(photo/chromosphere)
12. Mg I b2	518.36 nm	(photo/chromosphere)	27. Ca II	849.81 nm	(photo/chromosphere)
13. Fe I	525.04 nm	(photosphere)	28. Ca II	854.21 nm	(photo/chromosphere)
14. Mn I	553.78 nm	(HFS)	29. Ca II	866.22 nm	(photo/chromosphere)
15. He I	587.59 nm	(prominences; spicules)	30. Mn I	874.10 nm	(HFS)

Temporal Cadence:

10 sec per slit position (10 sec or shorter integration to reach $10^3 I_{cont}$ polarimetric signal from 450 nm longward, $2 \times 10^3 I_{cont}$ at 380 in 10 sec). The slit can be stepped between two adjacent positions in less than 200 ms.

10 minute reconfiguration for each spectral channel

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Polarimetric Capabilities and Accuracy:

Full Stokes vector polarimetry.

ViSP is a dual-beam polarimeter; the simultaneous, orthogonal states of polarization ($I \pm U$, Q , V , after polarization modulation) are imaged on the same camera, thus limiting the spectral coverage available in a single exposure.

Photometric Capabilities (Precision):

Flat fields repeatable to the 2% level.

Instrument Modes Available:

Polarimetric mode: full Stokes; slit steps from one position to the next after integration

Intensity-only mode: I only; slit moves continuously during exposure. Some blurring of the image but substantially faster. Read-out rate of camera can be selected.

Example Modes of Operation:

It is important to note that the ViSP instrument is designed for operational flexibility to meet a range of research needs, both those currently known and well understood and many unknown or only poorly understood. The instrument thus aims to serve a wide range of exploratory science, and the use cases below are only examples.

Use Cases:

1. Common use profile example – study of prominences

Example #1:	Prominences		
SPATIAL COVERAGE AND RESOLUTION			
Slit Width	0.0406" (matched to 650 nm)		
Spatial Sampling	0.0406" slit step size		
Steps	500		
Total Field of View	20.3" x 77.8"	20.3" x 61.0"	20.3" x 49.4"
X Spatial Resolution	0.082"	0.082"	0.083"
SPECTRAL INFO:			
	Band #1	Band #2	Band #3
Wavelength:	Ca II 396.85 nm	He I 587.59 nm	Ca II 854.21 nm
Y Spatial Binning	1	1	2
Y Spatial Resolution	0.061"	0.048"	0.077"
Bandwidth:	0.807 nm	1.224 nm	1.629 nm
Spectral Sampling	0.907 pm/pixel	1.375 pm/pixel	1.830 pm/pixel
Spectral Binning	1	1	1
Spectral Resolution	218000	213000	234000
TIMING SUMMARY			
Integration Time	10 s		
Map Duration	1:25:00		
Repeats	1		
Total Duration	1:25:00		
DATA RATES			
Data Rate	22.8 MB/s		
Data Volume	114 GB (does not include calibration data)		

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DKIST Instrument Summary Table

<https://www.nso.edu/telescopes/dkist/csp/docs/>



VBI Blue		VSP		VTF		VBI Red		DL-NIRSP		Cryo-NIRSP		Cryo-NIRSP (Context Imager)	
Wavelength	400-450 nm	400-1000 nm	400-1000 nm	400-1000 nm	400-1000 nm	400-1000 nm	400-1000 nm	400-1000 nm	400-1000 nm	400-1000 nm	400-1000 nm	400-1000 nm	400-1000 nm
Resolution	0.15 arcsec	0.15 arcsec	0.15 arcsec	0.15 arcsec	0.15 arcsec	0.15 arcsec	0.15 arcsec	0.15 arcsec	0.15 arcsec	0.15 arcsec	0.15 arcsec	0.15 arcsec	0.15 arcsec
Field of View	1.5 arcmin	1.5 arcmin	1.5 arcmin	1.5 arcmin	1.5 arcmin	1.5 arcmin	1.5 arcmin	1.5 arcmin	1.5 arcmin	1.5 arcmin	1.5 arcmin	1.5 arcmin	1.5 arcmin
Aperture	1.5 m	1.5 m	1.5 m	1.5 m	1.5 m	1.5 m	1.5 m	1.5 m	1.5 m	1.5 m	1.5 m	1.5 m	1.5 m
Weight	100 kg	100 kg	100 kg	100 kg	100 kg	100 kg	100 kg	100 kg	100 kg	100 kg	100 kg	100 kg	100 kg

This table is meant to give an idea of the capabilities of the DKIST first light instruments only. 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>

Visible light camera for instrument use provided by a CR instrument.

Instrument performance calculators:

<https://www.nso.edu/telescopes/dkist/csp/docs/>

Observational Settings

- Center GCS Field Position
- Radius (outer radii from disk center): 1.00
- Angle (degrees from West limb): 2.00
- Field Orientation (degrees): 2.00
- ODS Field Stop Diameter (arcmin): 0.0
- Coronal Background (milliunits of disk @600nm, R=1.1): 20.00
- Occulter: off

CryoNIRSP Settings

- Modulator:
 - On: Type (down)
 - Off: Position (down)
 - Out
- ND filters: down

General Plot

R = 1.100, sky brightness = 20.00

Spectral radiance in milliwatts of disk vs wavelength (μm). Legend: DelZavaria Q5, X corona, modtran sky, Hel Kuhn 1996, combined.

Timeline

Tree: Name | Cycle | Start Time | Stop Time | Data Volume(s) | Data Rate(MB/sec)

Buttons: Load Program, Run, Stop

VBI Instrument Performance Calculator

Sequence: Cycle [1]

Data Set Parameter Details:

- Settings
- Field Selection
- Filter Profile

Data Set Library:

- Ca II K
- G-band
- blue cont.
- H beta

Performance Metrics:

- Avg. Data Rate [MB/s]: -
- Data Volume [GiB]: -
- Peak Data Rate [MB/s]: -
- Total Duration: -
- Single Seq. Duration: -

VTF Instrument Performance Calculator v3.0

Config File Name: [text box]

Level of Light: 1.0

Buttons: DEFAULT, BASIC, ADVANCED

Line Counter	Line 1	Line 2	Line 3
Line	FeI_630.25	0	0
Scan Mode	blue-red	blue-red	blue-red
Binning	1x1	1x1	1x1
ROI	4096x4096	4096x4096	4096x4096
Central Wavelength (nm)	630.25	0	0
Exposure Time	25.0	25.0	25.0
Steps: Left-Right-Sum	-5 5 11	0 0 0	0 0 0
Spectral Step (pm)	3.15	0	0
Accumulations	8	8.0	8.0
SNR	667	0	0
Scan Position (nm)	0.0	0.0	0.0
Repeats	0	0	0
Cycle Time (sec)	32.34	0.0	0.0

Simulated Line Scan: 630.25 nm

Intensity vs wavelength in nm. Legend: simulated line scan, FTS profile, prefilter profile.

Buttons: RESET (x3)

No. of cycles: 1 | total run time: 0 min 0.00sec

Delay betw. cycles (s): 0.0 | Data Volume: 0.0 GiB (per camera)

DKIST Configuration Tool

Visible Broadband Imager (VBI)

VBI camera 1

- Ca II K (393.3 nm) | Weight: [text box] | Max. Data Rate [MiB]: [text box]
- G band (430.5 nm) | Weight: [text box]
- blue cont. (450.4 nm) | Weight: [text box]
- H-b (486.1 nm) | Weight: [text box]

VBI camera 2

- H-α (656.3 nm) | Weight: [text box]
- red cont. (668.4 nm) | Weight: [text box]
- TiO (705.4 nm) | Weight: [text box]
- Fe XI (789.2 nm) | Weight: [text box] | Max. Data Rate [MiB]: [text box]

Other options:

- Visible Spectro-Polarimeter (VISP)
- Visible Tunable Filter (VTF)
- Diffraction-Limited Near Infrared Spectro-Polarimeter (DL-NIRSP)
- Result
- Reflectance Graphs

DKIST CSP JIRA Site (<https://nso-atst.atlassian.net/secure/Dashboard.jspa>)



CSP Community DB

Introduction

Welcome to the DKIST Critical Science Plan development project.

Activity Stream

December 11

Valentin Pillat created UC-81 - Physical conditions at the Current Sheet during CMEs

December 08

Valentin Pillat commented on UC-90 - Synoptic Coronal Observations in support of PSP and Solar Orbiter

Alexandra Tschaefer commented on UC-90 - Synoptic Coronal Observations in support of PSP and Solar Orbiter

Hi Valentin, just a small correction: yes, the program asks for coordination but please choose "Synoptic" as Program Type

December 07

Valentin Pillat created UC-80 - Synoptic Coronal Observations in support of PSP and Solar Orbiter

Heat Map

Filament Other Plage or Network Prominence Quiet Corone Quiet Sun Sunspots and/or Pores None

There are 8 distinct "Type of Target(s)" values in 87 Issues

Two Dimensional Filter Statistic...

Type of Target(s)	Cryo-NRSP (http://NRK)
Filament	3
Other	2
Plage or Network	3
Prominence	3
Quiet Corone	4
Quiet Sun	6
Sunspots and/or Pores	6
None	0

Total Unique Issues: 12

Showing 8 of 8 statistics. Grouped by: Instrument Set Definition

Pie Chart: All CSP

Research Topic
Total Issues: 81

MC, M&EP: The Chromosphere-C...	15
None	10
MID&DP: Small-Scale Photospher...	9
MID&DP: Sunspots, Umbra and P...	9
FMEA: Coronal Magnetic Field Stru...	7
MID&DP: Wave Generation and Pr...	6
FMEA: Magnetic Field Connectivity...	4
LTS: Long-Term Studies of the Sun	4
MC, M&EP: Spicule Physics	3
MID&DP: Flux Emergence and Ac...	3
Other...	16

Bubble Chart: All CSP

Create a new Science Use Case

The image shows a multi-step process for creating a new Science Use Case (UC) in a web application. The interface is divided into several panels:

- Left Panel (Navigation):** A blue sidebar with a search icon and a '+' icon. A red arrow points to the '+' icon. Below it are menu items: 'All CSP', 'My open issues', 'Reported by me', 'All issues', 'Open issues', 'Done issues', 'Viewed recently', 'Created recently', 'Received recently', 'Updated recently', and 'Manage filters'.
- Top Panel (All CSP):** A white header with 'All CSP' and a star icon. Below it is a search bar and a list of filters.
- Second Panel (CSP):** A white header with 'CSP' and a star icon. Below it are two options: 'Issue' (with a folder icon) and 'Project' (with a folder icon). A red arrow points to the 'Issue' option.
- Third Panel (Create issue form):** A white form titled 'Create issue' with a 'Configure fields' link. The form contains the following fields:
 - Project:** A dropdown menu with 'Critical Science Plan: Use C...' selected.
 - Issue Type:** A dropdown menu with 'Science Use Case' selected.
 - Summary:** A text input field. A blue note next to it says '(NOTE: Summary == Title)'. Below the field is a small warning: 'Some issue types are unavailable due to incompatible field configuration and/or workflow associations.'
 - Principal Investigator:** A text input field.
 - PI Affiliation:** A text input field.
 - Abstract:** A large text area. Below it is a prompt: 'Please provide a short summary of your Science Use Case.'
 - Additional Users to E-mail:** A text input field.
 - Program Type:** A group of radio buttons:
 - None
 - Regular (None of the below)
 - Target of Opportunity
 - Synoptic
 - Coordinated

At the bottom right of the form are three buttons: 'Create another', 'Create', and 'Cancel'.

DKIST CSP: JIRA User's Guide

Editing your Science Use Case (PI, Co-I)

The screenshot displays the JIRA interface for editing a Science Use Case (UC-91). The interface is split into three main sections:

- Left Sidebar:** A navigation menu with options like 'Issues', 'Search issues', 'All CSP', 'My open issues', 'Reported by me', 'All issues', 'Open issues', 'Done issues', 'Viewed recently', 'Created recently', 'Resolved recently', 'Updated recently', and 'Manage filters'.
- Main Issue View:** Shows the issue title 'Physical conditions at the Current Sheet trailing CMEs' and a list of actions: 'Edit', 'Comment', 'Assign', 'Start Progress', and 'Admin'. A red arrow points to the 'Edit' button. Below the title are tabs for 'GENERAL INFORMATION', 'SCIENCE JUSTIFICATION', 'OBSERVATION SPECIFICS', 'TARGET SPECIFICS', and 'INSTRUMENT SPECIFICS'. The 'GENERAL INFORMATION' tab is active, showing fields for 'PI Affiliation' (National Solar Observatory) and 'Abstract' (CMEs eruption are known to have a trailing current sheet where reconnection occurs...).
- Right-hand 'Edit issue' Form:** Titled 'Edit issue: UC-91', this form contains the same tabs as the main view. The 'SCIENCE JUSTIFICATION' tab is active, showing a 'Summary' field with the text 'Physical conditions at the Current Sheet trailing CMEs'. Below this are fields for 'Principal Investigator' (vmpillet), 'PI Affiliation' (National Solar Observatory), and 'Abstract' (CMEs eruption are known to have a trailing current sheet where reconnection occurs...).

DKIST CSP **Science Use Case** development strategy:

1. Formulate science context and goals
(JIRA form tabs – General Information, **Science Justification**, Target Specifics)
2. Identify observational needs (spectral lines of interest, pattern, cadence, sensitivities)
(JIRA form tab – **Observation Specifics**, Instrument Specifics)
3. Determine useful DKIST instrument suite
(JIRA form tabs – Observation Specifics, **Instrument Specifics**)
FIDO – aka Coudé configuration and Data Rate tool, aka Beam Splitter Tool
4. Assess individual instrument performance capabilities
(JIRA form tabs – **Instrument Specifics**)
Instrument Performance Calculators (IPCs)

DKIST CSP: JIRA User's Guide

Status and Labels Fields

This screenshot shows the JIRA issue page for 'DKIST and Solar Orbiter observations for understanding the creation of upflowing plasma on the Sun'. The issue is currently in 'OPEN' status. A red arrow points to the 'Start Progress' button in the top action bar, which is used to change the status to 'Start Progress'.

This screenshot shows the same JIRA issue page. A red arrow points to the 'Labels' field, which is currently set to 'None'. A second red arrow points to the '...' menu icon next to the 'Labels' field, indicating where to click to edit the labels.

- For now please do not select *Start Progress* (which changes the *Status* field)
- If you worked on your Science Use Case as part of a DKIST CSP Workshop, please edit *Labels* as:
 - CSPW-SPD2016
 - CSPW-Huntsville
 - CSPW-DC
 - CSPW-Freiburg
 - CSPW-Nagoya
 - CSPW-JHU/APL
 - CSPW-Newcastle
 - CSPW-NMSU
 - CSPW-Rice
 - CSPW-Maui
 - CSPW-Bozeman
 - CSPW-Synoptic
 - **CSPW-LasCruces**as appropriate.

<https://www.nso.edu/telescopes/dkist/csp/>

- Critical science description (living document) with links to Science Use Case titles and abstracts, and ultimately their full text
- Links to Instrument and other summary documents
- Links to beam-splitter configuration and data rate analysis tool (FIDO)

NOTE: Links to ALL documents, FIDO tool, and IPCS can be found at <https://www.nso.edu/telescopes/dkist/csp/docs/>

<http://nso-atst.atlassian.net/>

Collaborative JIRA environment for Science Use Case development, and ultimately Observing Proposal development

<https://www.dropbox.com/sh/uzwdc03ayovxr5o/AABuZbWtCnfPqG8F2zHaeCFta?dl=0>

Dropbox link with summary documents (Instruments, Data Handling System (DHS), Facility Instrument Distribution Optics (FIDO), JIRA User's guide), and Instrument Performance Calculators (IPCs)