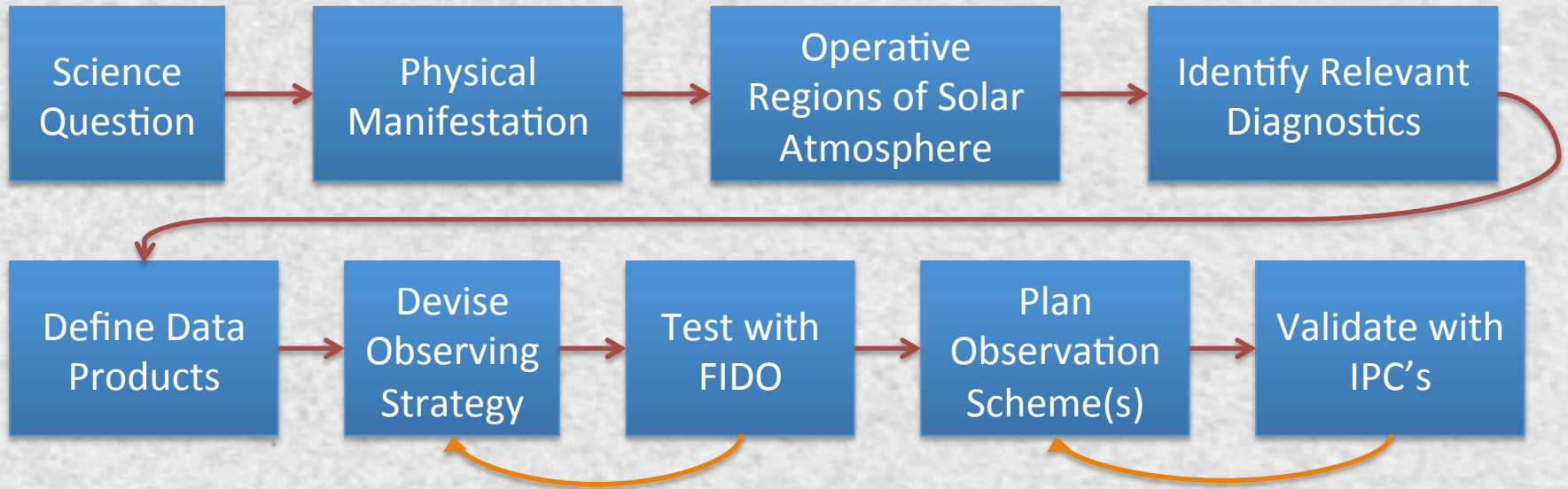


## DKIST Critical Science Plan Workshop:

# Structure and Dynamic Evolution of Photospheric Magnetic Fields


How to write a Science Use Case




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

Collaborative JIRA environment for Science Use Case development

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



◆


🔍 Dashboards

📁 Projects

📄 Issues

⚙️ Settings

🎯 Tests

NEW JIRA EXPERIENCE

📌 What has changed?

✖️ Turn off for now

## CSP Community DB

### Introduction

Welcome to the DKIST Critical Science Plan development project.

### Activity Stream

#### Activity Stream

December 11



**Valentin Pillet** created UC-91 - Physical conditions at the Current Sheet trailing CMEs

LLL Comment Vote Watch

December 08



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

Done

LLL Comment Watch



**Alexandra Tritschler** 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.

LLL Comment Watch



**Valentin Pillet** created UC-90 - Synoptic Coronal Observations in support of PSP and Solar Orbiter

LLL Comment Vote Watch

December 07

### Heat Map

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

There are 8 distinct "Type of Target(s)" values in 81 issues

### Two Dimensional Filter Statistic...

Type of Target(s)	Cryo-NIRSP ( <a href="http://dkist">http://dkist</a> )
Filament	3
Other	2
Plage or Network	3
Prominence	3
Quiet Corona	4
Quiet Sun	6
Sunspots and/or Pores	6
None	0
<b>Total Unique Issues:</b>	<b>12</b>

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

### Pie Chart: All CSP



### Research Topic

Total Issues: 81

- MC, M&EF: The Chromosphere-C... 11
- None 10
- MHD&DP: Small-Scale Photospher... 9
- MHD&DP: Sunspots: Umbral and P... 9
- F&EA: Coronal Magnetic Field Stru... 7
- MHD&DP: Wave Generation and Pr... 6
- F&EA: Magnetic Field Connectivity... 4
- LTS: Long-Term Studies of the Sun 4
- MC, M&EF: Spicule Physics 3
- MHD&DP: Flux Emergence and Ac... 3
- Other... 15

### Bubble Chart: All CSP



# DKIST CSP: JIRA User's Guide

## Create a new Science Use Case

The screenshot displays the JIRA interface for DKIST CSP. On the left is a blue sidebar with navigation options: 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. The main area shows a list of issues under the heading 'All CSP'. A red arrow points to the 'Issue' button in the main view. Another red arrow points to the 'Issue' button in the 'Create issue' dialog box. The 'Create issue' dialog box is open, showing the following fields:

- Project: Critical Science Plan: Use C...
- Issue Type: Science Use Case
- Summary: (NOTE: Summary == Title)
- Principal Investigator
- PI Affiliation
- Abstract
- Additional Users to E-mail
- Program Type: Regular (None of the below)

At the bottom right of the dialog box, there are buttons for '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 organized into several key sections:

- Left Sidebar:** Contains navigation options such as '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 Content Area:** Shows a list of use cases on the left and a detailed view of UC-91 on the right. The detailed view includes the title 'Physical conditions at the Current Sheet trailing CMEs', a status of 'Unresolved', and an 'Edit' button highlighted by a red arrow. Below the title are tabs for 'GENERAL INFORMATION', 'SCIENCE JUSTIFICATION', 'OBSERVATION SPECIFICS', 'TARGET SPECIFICS', and 'INSTRUMENT SPECIFICS'. The 'SCIENCE JUSTIFICATION' tab is active, showing the abstract: 'CMEs eruption are known to have a trailing current sheet where reconnection occurs and that likely results in the post flare loops arcades. By doing off-limb spectroscopy and polarimetry of this region we can constrain the physics of the reconnection processes.'
- Right Sidebar:** Contains the 'Edit issue: UC-91' form. It includes tabs for 'GENERAL INFORMATION', 'SCIENCE JUSTIFICATION', 'OBSERVATION SPECIFICS', 'TARGET SPECIFICS', and 'INSTRUMENT SPECIFICS'. The 'GENERAL INFORMATION' tab is active, showing fields for 'Summary' (Physical conditions at the Current Sheet trailing CMEs), 'Principal Investigator' (vmpillet), 'PI Affiliation' (National Solar Observatory), 'Abstract' (CMEs eruption are known to have a trailing current sheet where reconnection occurs and that likely results in the post flare loops arcades. By doing off-limb spectroscopy and polarimetry of this region we can constrain the physics of the reconnection processes.), 'Additional Users to E-mail' (Adam.Kowalski, Gianna.Cauzzi, han.huitenbroek, katharine.reeves), 'Program Type' (Target of Opportunity), and 'Observing Coordination' (We will need to make sure a CME is occurring and understand where the current sheet behind the CME is located. This might require AIA/IRIS coordination.).

## 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 instrument performance capabilities

(JIRA form tabs – Instrument Specifics)

**Instrument Performance Calculators (IPCs)**

# Determine useful DKIST instrument suite

## DKIST Instrument Summary Table

<http://dkist.nso.edu/CSP/instruments>

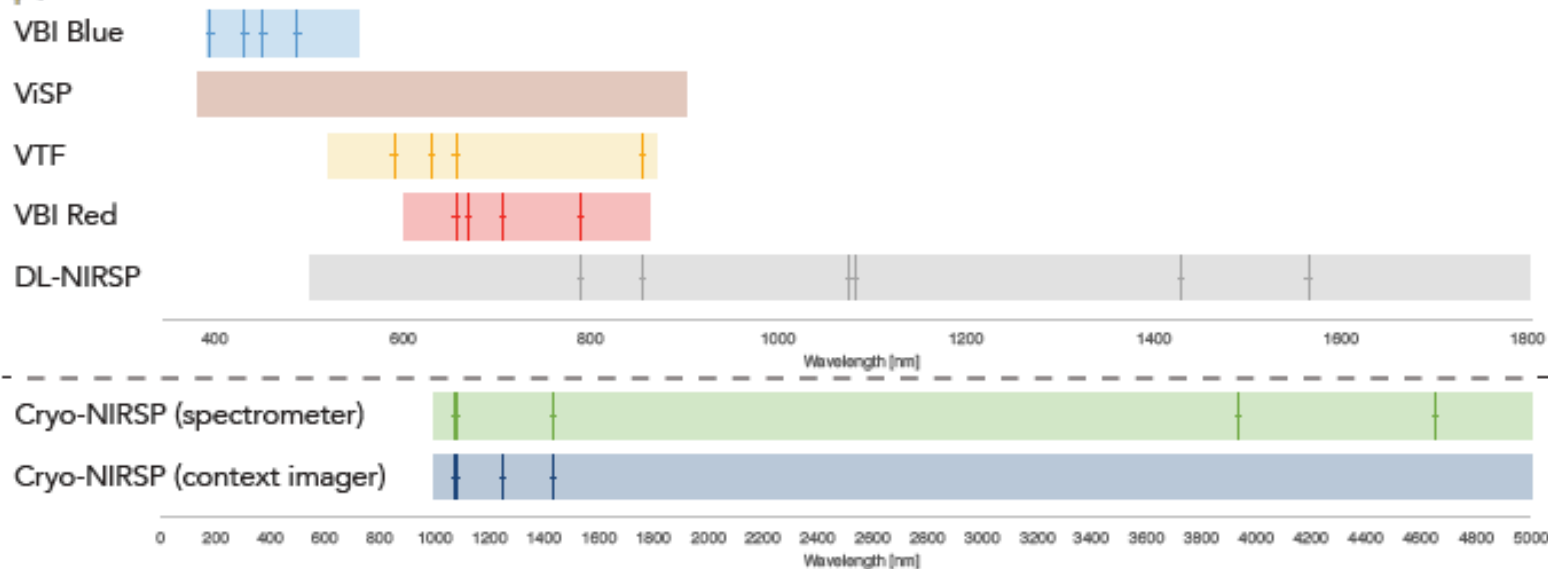
	Instrument type	Spectral range	Spectral resolution	Spatial sampling	Maximum Instantaneous Field of View	Maximum Sampled Field of View	Peak Cadence	Analogous Instruments
Visible Broadband Imager <i>VBI (Blue)</i>	High Cadence, High Resolution Imager	390-550nm (sequential filter sequencing)	N/A	0.011"	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 50" (arm 1) 0.041" or 60" (arm 2) 0.053" or 75" (arm 3) 0.106" or 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 <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>



# DKIST Instrument Summary Table

<http://dkist.nso.edu/CSP/instruments>

<http://dkist.nso.edu/sites/atst.nso.edu/files/science/CSP/fido160613.pdf>



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 XI 789nm	Fe XIII 1074.7nm	Fe XIII 1074.7nm
G-band 430.52nm		Fe I 630.25nm	Continuum 668.423nm	Ca II 854.2nm	Fe XIII 1079.7nm	He I 1083nm
Continuum 450.287nm		H-alpha 656.3nm	Ti O 705.839nm	Fe XIII 1074.7nm	He I 1083 nm	J Band 1250nm
H-beta 486.1nm		Ca II 854.2nm	Fe XI 789.186nm	He I 1083nm	Si X 1430nm	Si IX 1430nm
				Si X 1430nm	Si IX 3935 nm	
				Fe I 1565nm	CO 4651nm	

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>

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



**All CSP** Save as Details ★

Critical Scienc... Type: All Status: All Assignee: All Contains text More Q Advanced

UC-72 Observe Coronal and Chromospheric Jets in ...

UC-71 Structure, Dynamics, and Magnetic Environ...

UC-70 Magnetic structure, formation and evolution ...

**UC-69 Science Use Case instructions**

UC-65 Evolution of 3D magnetic configuration at m...

UC-64 FIP fractionation as tracer of solar wind sour...

UC-63 Short-term evolution of internetwork magnet...

UC-62 Are quiet-Sun internetwork fields turbulent? ...

UC-61 DKIST and Solar Orbiter observations for un...

UC-60 Coronal helium abundance from joint DKIST ...

UC-59 Co-ordinated observations with DKIST and S...

UC-58

1 2 >

Critical Science Plan: Use Case (UC) Development / UC-69 24 of 82 ^ v

## Science Use Case instructions

Edit Comment Assign Start Progress Admin v

Type: Science Use Case Assignee: Mark Rast

Status: OPEN (View workflow) Reporter: Mark Rast

Priority: Minor Principal Investigator: Mark Rast

Resolution: Unresolved

Labels: None

Votes: 0

Watchers: 0 Start watching this issue

Created: 02/Nov/17 7:31 AM

Updated: 19/Dec/17 4:02 PM

GENERAL INFORMATION

SCIENCE JUSTIFICATION

OBSERVATION SPECIFICS

TARGET SPECIFICS INSTRUMENT SPECIFICS

PI Affiliation:  
Use Case Principle Investigator is generally also the UC creator. PI can add Co-Is (via 'Additional Users to E-mail' field) and can re-assign UC to another PI. CO-I's must have CSP JIRA account (send email address [DKISTCSP@nso.edu](mailto:DKISTCSP@nso.edu) for account request).

Abstract:  
Please provide a short summary of your

# DKIST CSP: JIRA User's Guide

## Status and Labels Fields

- 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-Bozeman
  - CSPW-Synopticas appropriate.

The 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 with a 'Minor' priority and 'Unresolved' resolution. The 'Labels' field is currently empty. A red arrow points to the 'Start Progress' button in the action bar, which is highlighted in blue. The left sidebar shows the 'All CSP' filter selected.

The screenshot shows the same JIRA issue page. A red arrow points to the 'Labels' field, which is currently empty. A blue arrow points to the 'More' menu icon (three dots) in the action bar. The left sidebar shows the 'All CSP' filter selected.