Sunspot Solar Observatory

Contact

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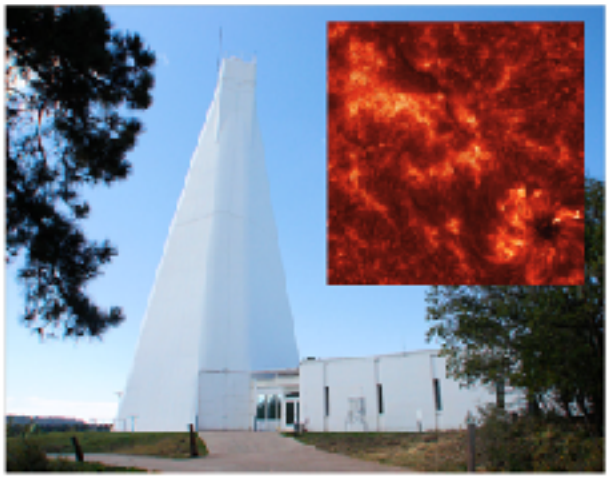
Sunspot Solar Observatory



The Dunn Solar Telescope:
A Transition to Operations by Sunspot Solar Observing Consortium

- Key elements of the synoptic plan success
  - Fundmental science questions
  - Large, regular blocks of time
  - Flexible switching
  - Simple observer flowchart
  - Data provision

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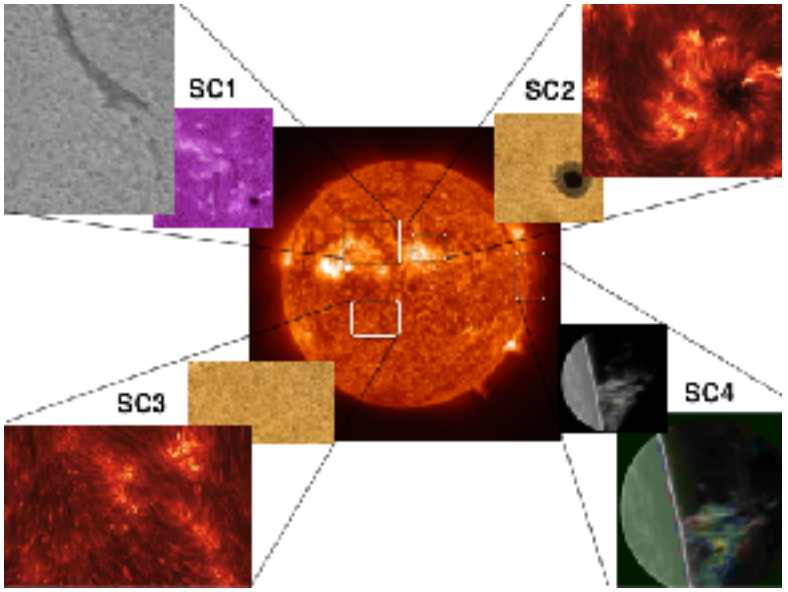
- SC1: Filament Magnetic Fields
- SC2: Flare patrol
- SC3: Chromospheric Canopy
- SC4: Prominence instabilities



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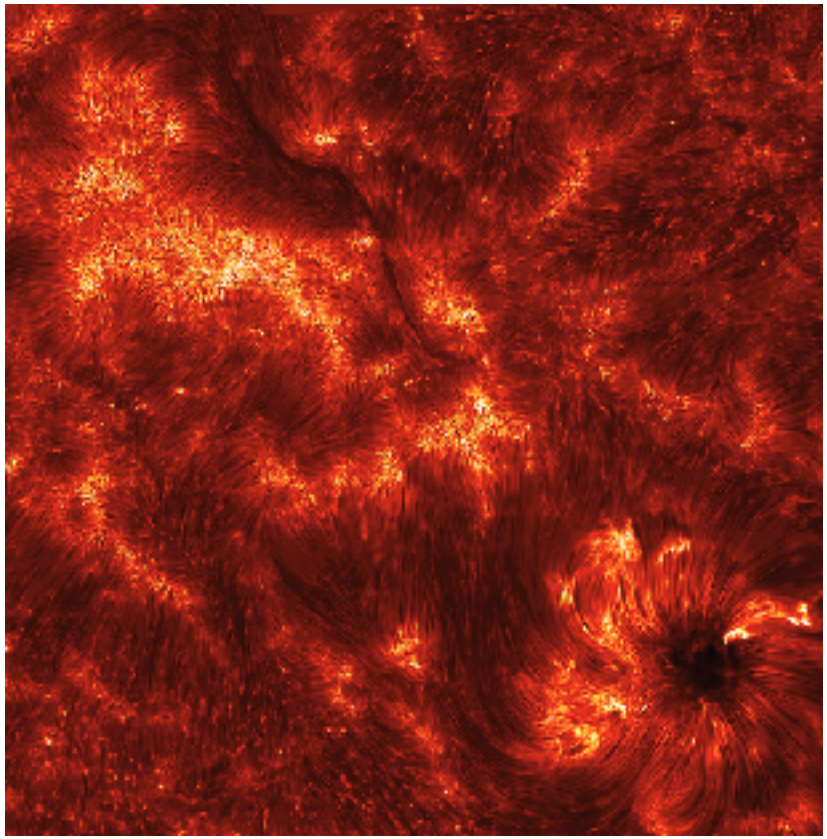
June 18
June 19
June 20
June 21
June 22
June 25
June 26
June 27
June 28
July 05
July 16
July 17
July 18
July 23
August 16
August 17
August 20
August 30
September 24
September 25



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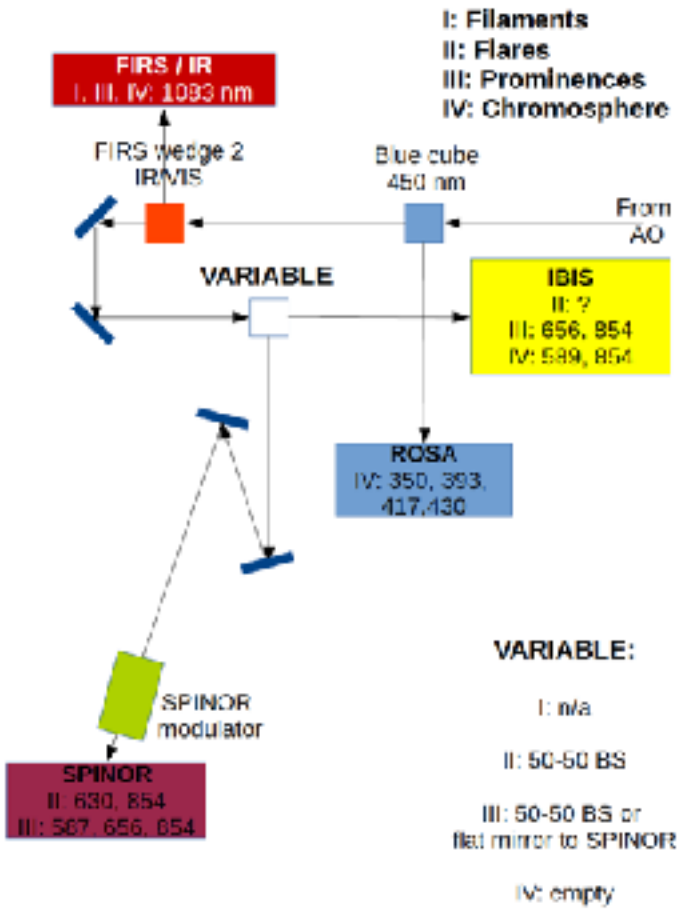
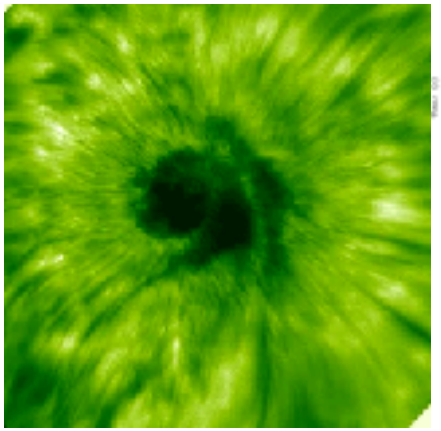
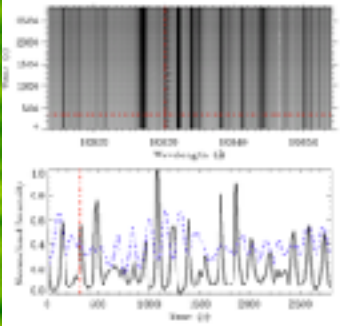
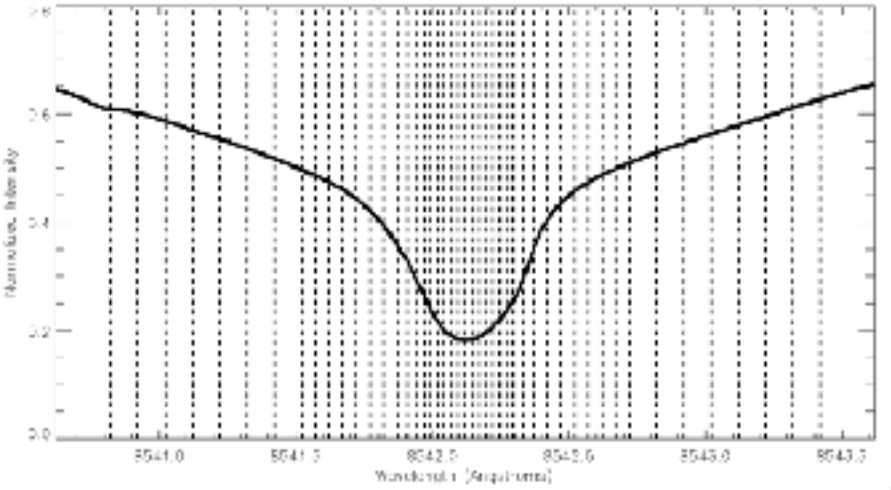
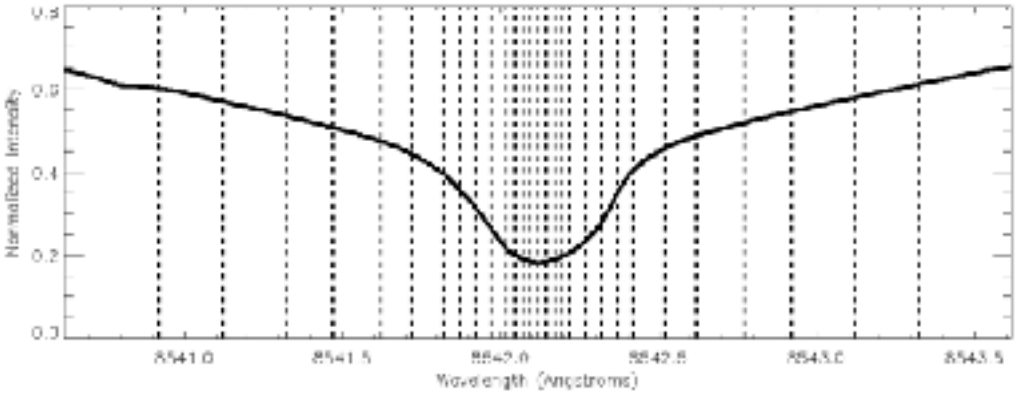










R.T. James McAteer

NM STATE

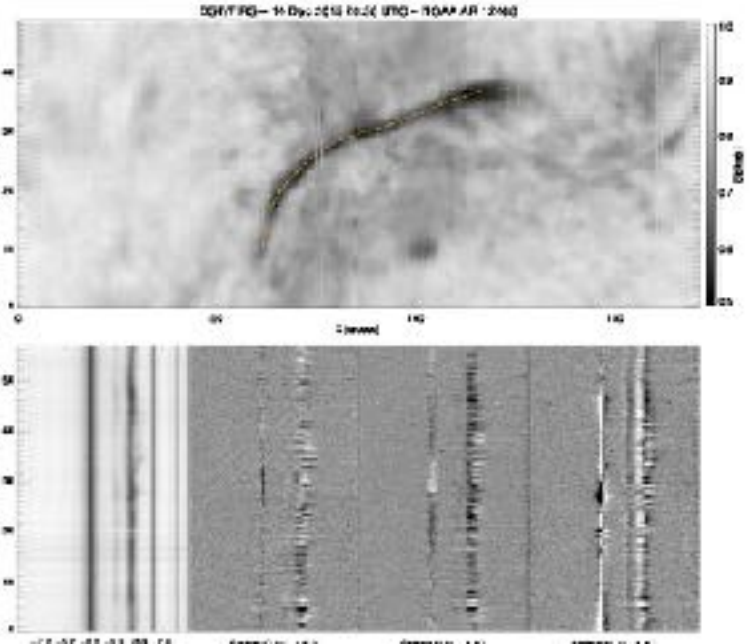
General setup:

Fixed:

- Blue cube (< 500 nm) stays always in the beam.
- ROSA setup < 450 nm stays always on the table.
- FIRS wedge 2 (transmits 550-860 nm, reflects > 900 nm)
- FIRS always set up for 1083 nm single slit.
- IBIS always set up for spectroscopy.
- SPINOR modulator always upfront of the slit, not in the

Variable:

- light feed between IBIS and SPINOR. Options:
  - empty (Proposal IV)
  - 50-50 BS (Proposal II and III)
  - flat mirror reflecting towards SPINOR (Proposal III)
- IBIS wavelengths (589, 656, 854 nm)
- SPINOR internal setup (630, 854 nm or 587, 656, 854 nm



Proposed programs:

Red font indicates a change from the original proposal.

I: Filaments

FIRS: 1083 nm

II: Flares

SPINOR: 630, 854 nm

IBIS: not defined.

IBIS cannot be used as SPINOR slit-jaw even in spectroscopic mode because of the SPINOR modulator.

50-50 BS between SPINOR and IBIS.

III: Prominences

FIRS: 1083 nm

SPINOR: 587, 656, 854 nm

Possible options:

a) 50-50 BS between SPINOR/IBIS. IBIS: 656, 854 nm.

b) Flat mirror towards SPINOR, no IBIS.

IV: Chromosphere

FIRS: 1083 nm

ROSA: 350, 393, 417, 430 nm

IBIS: 589, 854 nm

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Decision Tree for Synoptic Observing

1. IF there is a major flare watch, THEN sunspot context and flare observations should be conducted for as long as seeing is good.
2. ELSEIF coordinated observing has been planned (e.g. IRIS), THEN observations on the feature of interest should be done for a time range that is appropriate for the coordination attempt.
3. ELSEIF solar filaments are present, THEN filament observations should be done, with one scan per filament.

- THEN, IF active regions are also present, THEN sunspot context observations should be done, with one scan per active region.
- THEN, IF all other options have been exhausted, THEN quiet sun observations at disk center should be done, continuing for as long as seeing is good.

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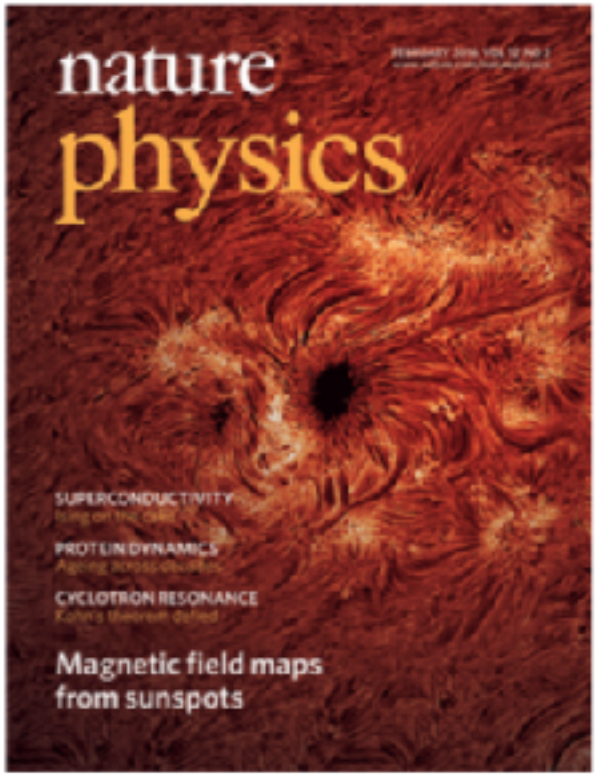

http://solardisk.nmsu.edu/ [yyyy/mm/dd/instrument]

Date YYMMDD	Time HHMM	Status	CO	Notes
180605	1807	pixels inverted		noise 8e-4, B 400-1000 Gauss, directions of B not consistent
151214	2058	Level 2		noise 3e-4, B 100-300 Gauss
171017	1523	Level 0		10 coadd,
171030	1501	Level 0		10 coadd,
180621	1356	pixels inverted	I	15 coadd, noise 2e-4, B 50-300 Gauss,
180621	1520	evaluated	I	15 coadd, quv011,
180622	1428	evaluated	I	15 coadd, quv300,
180622	1517	evaluated	I	15 coadd, quv110,
180625	1438	evaluated	I	quv111,
180625	1521	evaluated	I	quv311,
180625	1612	evaluated	I	quv100,
180626	1335	evaluated	I	quv000,
180626	1425	evaluated	I	quv000,
180626	1513	evaluated	I	quv000,
180626	1602	evaluated	I	quv000,
180627	1345	evaluated	IS	quv000,
180627	1440	evaluated	IS	quv000,
180627	1535	evaluated	IS	quv000,
180705	1400	evaluated	IS	quv111,
180716	1354	evaluated	I	10 coadd, quv113,
180716	1451	evaluated	I	10 coadd, quv300,
180717	1334	evaluated	I	quv011,
180717	1427	evaluated	I	quv311,
180723	1404	evaluated	I	10 coadd, quv333,
180723	1440	evaluated	I	10 coadd, quv111,
180723	1535	evaluated	I	10 coadd, quv133,

180627	1440	evaluated	IS	quv000,
180627	1535	evaluated	IS	quv000,
180705	1400	evaluated	IS	quv111,
180716	1354	evaluated	I	10 coadd, quv113,
180716	1451	evaluated	I	10 coadd, quv300,
180717	1334	evaluated	I	quv011,
180717	1427	evaluated	I	quv311,
180723	1404	evaluated	I	10 coadd, quv333,
180723	1440	evaluated	I	10 coadd, quv111,
180723	1535	evaluated	I	10 coadd, quv133,
180816	1414	Level 0	I2	15 coadd, no good Pcol,
180817	1400	Level 0	I2	good map,
180830	1434	Level 0		very weak filament,
180924	1417	Level 0	I	12 coadd
180924	1539	Level 0	I	12 coadd
180925	1408	Level 0	I	12 coadd
180925	1313	Level 0	I	12 coadd

Column 3, Status Sequence: Level 0, Level 1, [polarization signal strength] evaluated, cleaned (name) pixels inverted, inverted, Level 2.

Column 4: CO stands for Concurrent Observation. I stands for IBIS. 3 stands for 3PENOR.

Column 5: Evaluation results: quv333 means good polarization signal in filament region. quv000 means no quv signal in filament region before data cleaning. Evaluation results do not reflect SNR after cleaning will. This step will be skipped.

Notes:

1. Reason of weak or no polarization signal is weak magnetic field. Increasing coadd number to 15 may be helpful.
2. Current triages removal method is FFT filter. will try PCA method (Cassini & Li, HAO) and compare results.
3. Current inversion code is HAZF (Dhe), may switch to HAZEL ? in future.
4. Currently, to identify filaments in this list, data users must go to observer log. How about adding one column (4 letters) in the list to show filament position, such as "N30W29"?

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- Key elements of the SSO synoptic plan success
  - 3 specific, focused, science questions
  - 3 months getting ready. Will now run 50% of observing time.
  - One baseline-set optical bench set up
  - Immediate targeting decision lies with the observers.
  - Level 1, level 1+ and level 2 data

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- Key elements of a DKIST synoptic plan success?
  - Can we prioritize elements of a base synoptic-type program on a 4m-class telescope?
  - Can we force ourselves into only requesting the minimum?
  - Is there one FIDO set up that would allow for all ‘synoptic’ programs to run?
  - Where does the immediate targeting decision lie?
  - Should we try to tag or prioritize certain specific DKIST data?