



Solar Magnetic Activity Research Telescope (SMART) and SOT

S.Nagata (Kyoto Univ)

SMART and SOT



- Hida Observatory Kyoto Univ.
- SMART Telescope
- Collaboration between SMART and SOT

Two observatories:

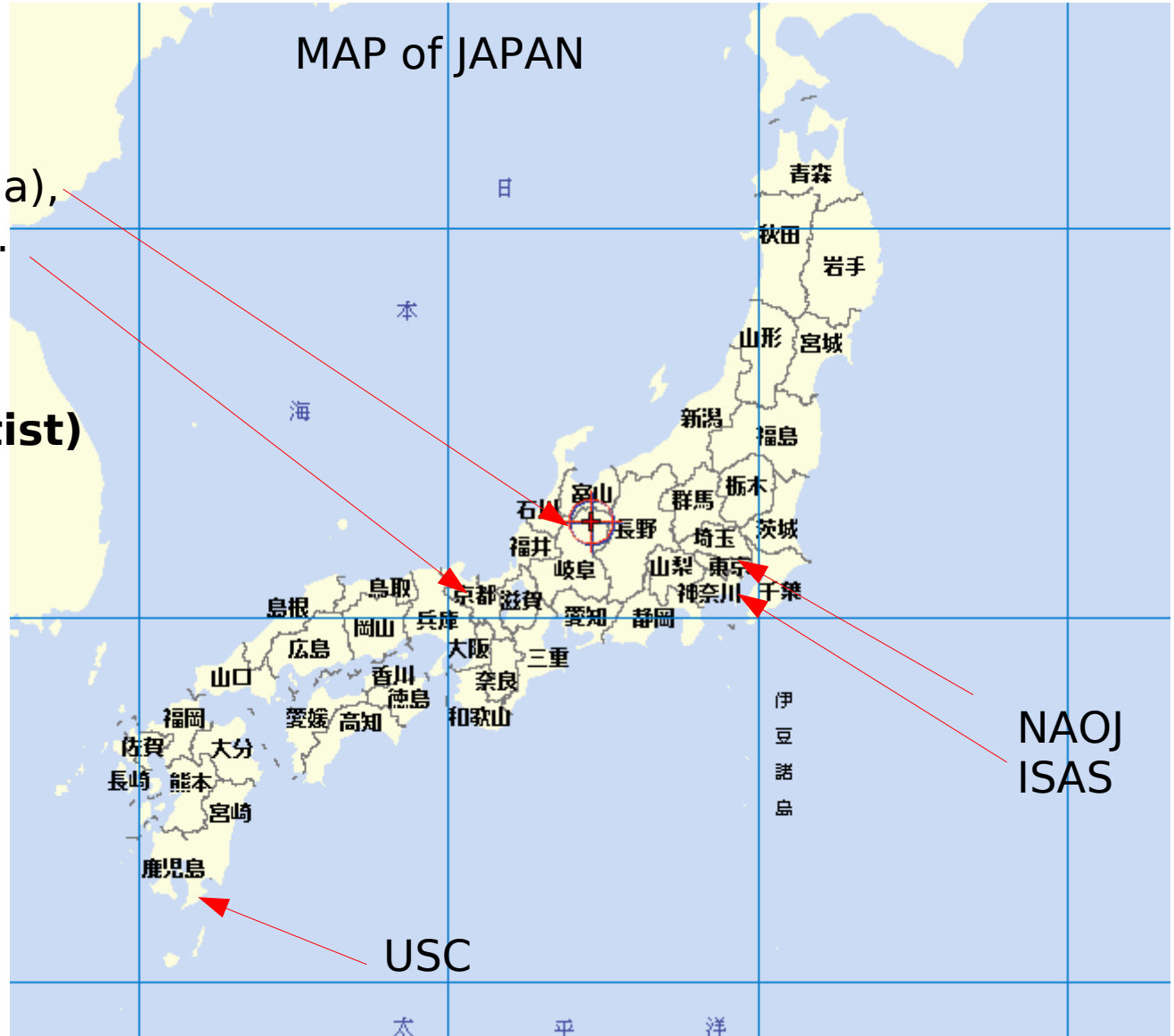
Hida Observatory (Takayama),
Kwasan Obsevatory (Kyoto).

Director:
Prof. K. Shibata
(SOLAR-B Project Scientist)



11 researchers
17 graduate students
15 Support staff

SOT17
April 17-20, 2006





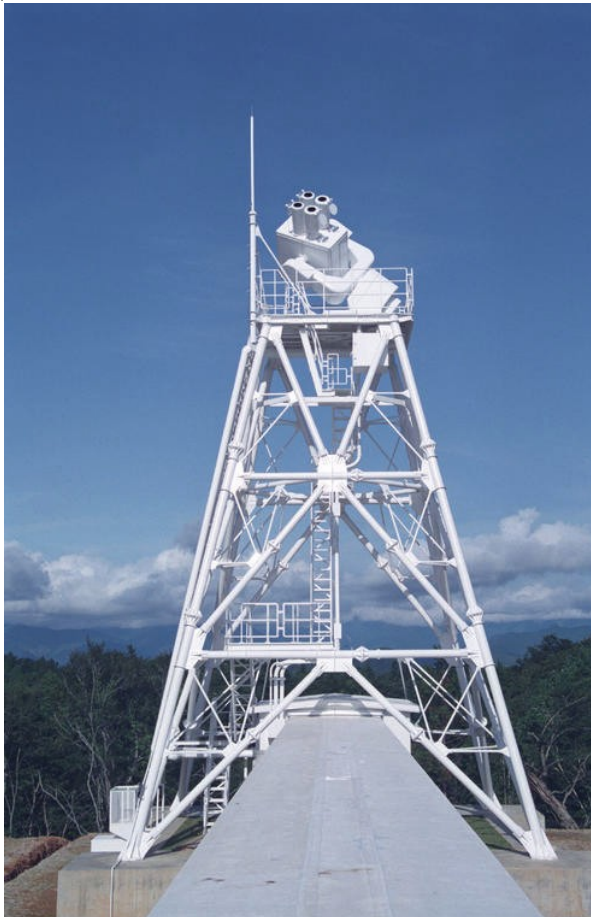
花山天文台

Established 1929 Oct.



飛驒天文台

Established 1968 Nov.



Technical point of view....

- Place on the top of 16m height tower to be free from seeing on the ground.
- Open-air tower, coated with low absorption.
- Open but rigid structure; displacement on the roof-top suppressed less than 40 μ m against 5 m/s wind.
- Temperature inside the box is controlled around 25 deg. C by air-conditioner.

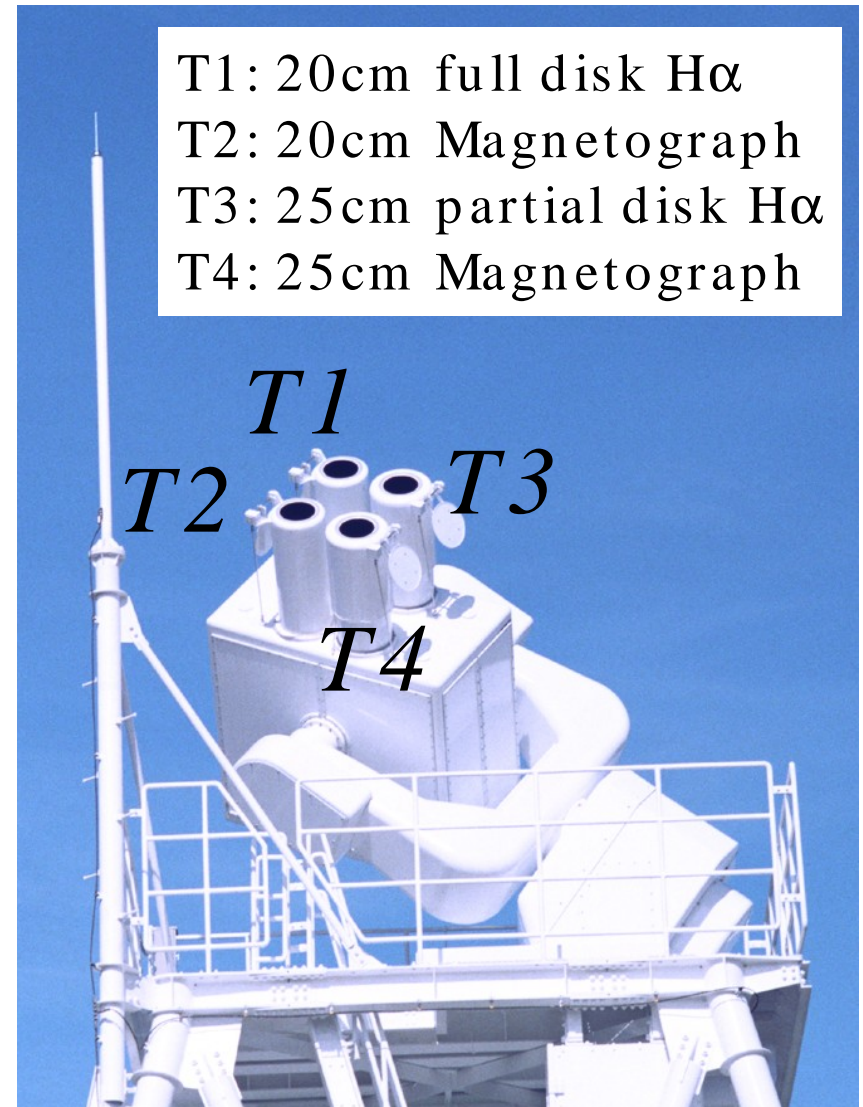
A package of middle size imaging telescopes

Scientific Point of View

- Aims to reveal the energy storage mechanism of solar flares.
- Full disk** chromosphere observation with H-alpha, and photospheric magnetic field observation.
- Four telescopes in a single package to perform various observations simultaneously.

Full disk AR monitoring telescope

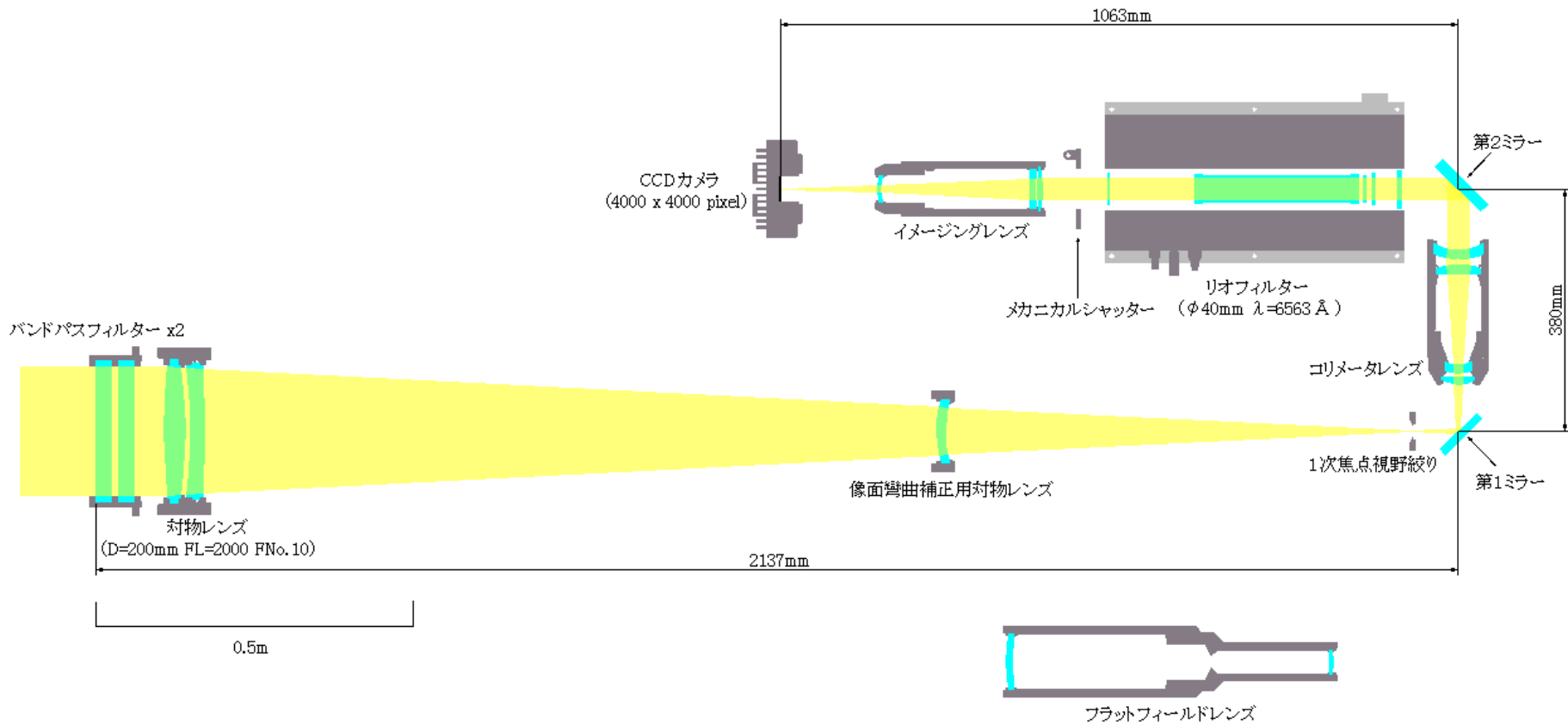
T1: 20cm full disk H α
T2: 20cm Magnetograph
T3: 25cm partial disk H α
T4: 25cm Magnetograph



望遠鏡 口径	観測像	視野	カメラ 画素数	ピクセル 分解能	望遠鏡 分解能
20 cm	H α 全面像	2300×2300 秒角	4000×4000	0.58"	0.8" (6563 Å)
20 cm	磁場 全面 (10cm ϕ 絞り) 部分	2000×2000 秒角	2000×2000	1"	1.5" (6302 Å)
		500×500 秒角	2000×2000	0.25"	0.7" (6302 Å)
25 cm	H α 部分像	1000×1000 秒角	4000×4000	0.25"	0.6" (6563 Å)
25 cm	磁場部分像モード	400×400 秒角	4000×4000	0.1"	0.6" (6302 Å)
			4000×4000	0.1"	0.6" (6302 Å)
	2色部分像モード	1000×1000 秒角	4000×4000	0.25"	0.4" (4300 Å)
			4000×4000	0.25"	0.6" (6563 Å)

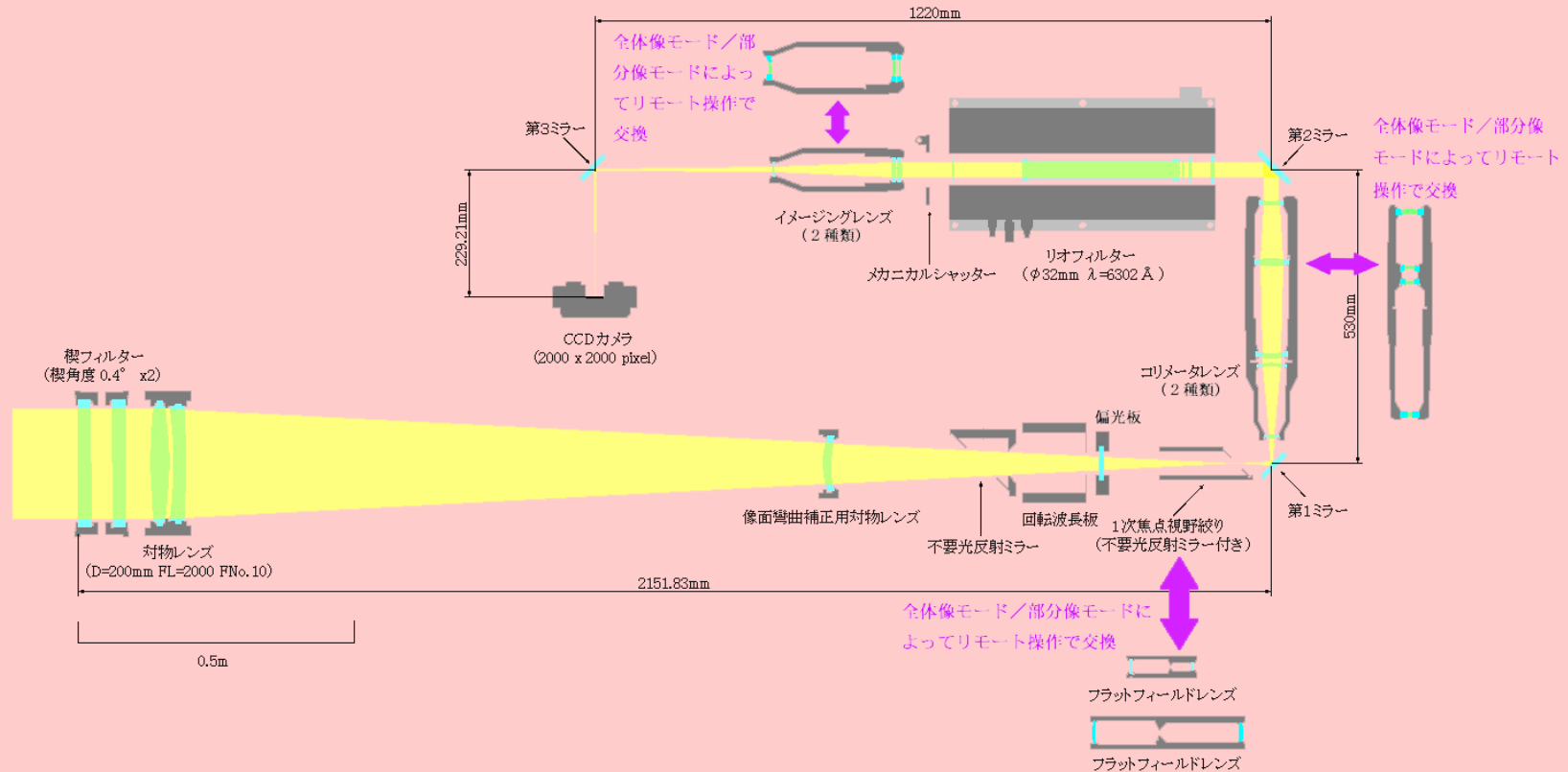
Optical Layout of T1

20cm H α 全体像望遠鏡



Optical Layout of T2

20cm 磁場望遠鏡

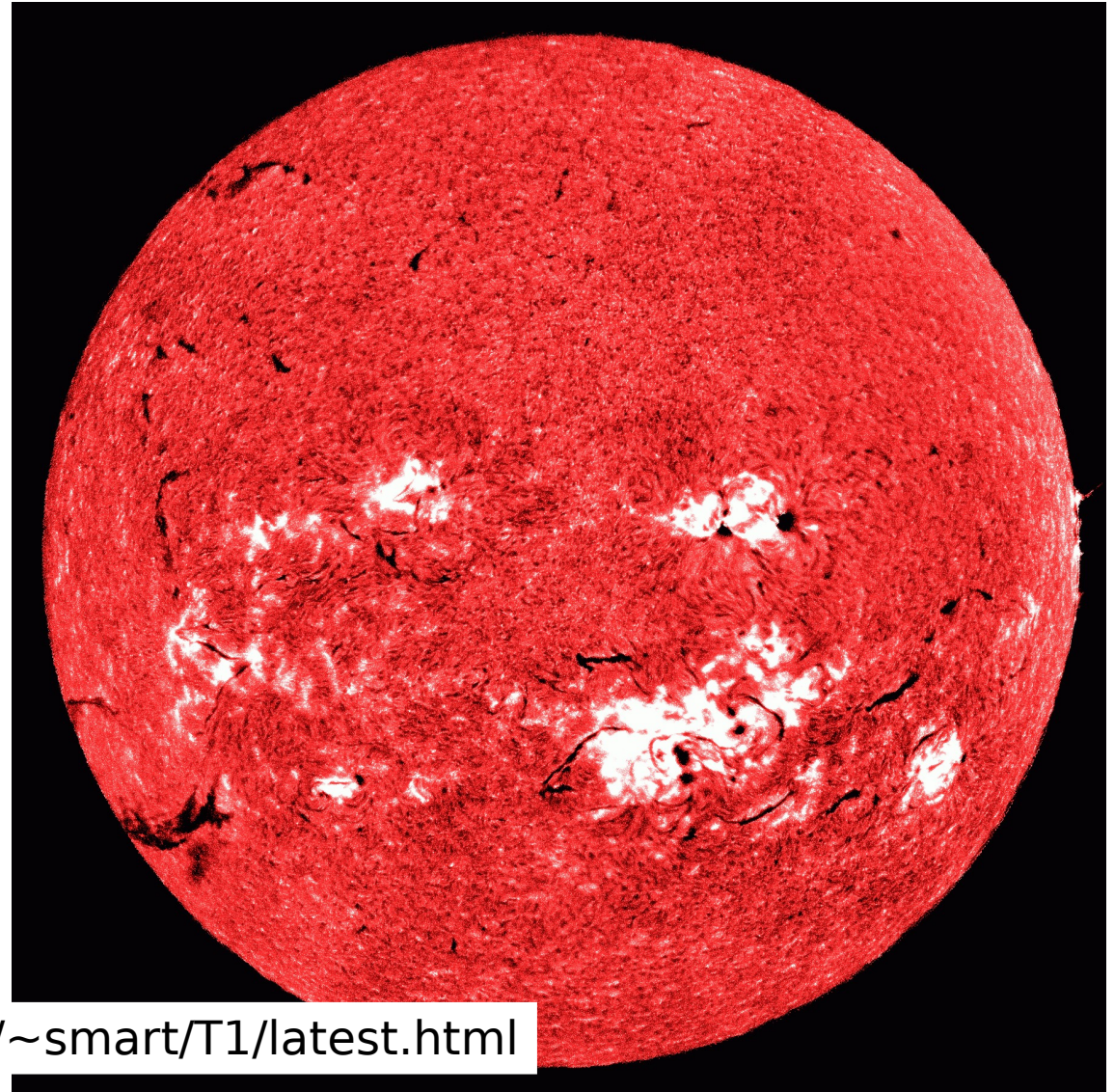


T1 (20cm dia.):

full disk image
pixel resolution $\sim 0.''6$
4k X 4k image
line scan
cadence ~ 5 sec

T3 (25 cm dia.):

partial frame \sim
pixel resolution
4k X 4k image
line scan
cadence ~ 5 sec



<http://www.kwasan.kyoto-u.ac.jp/~smart/T1/latest.html>

SMART Magnetogram



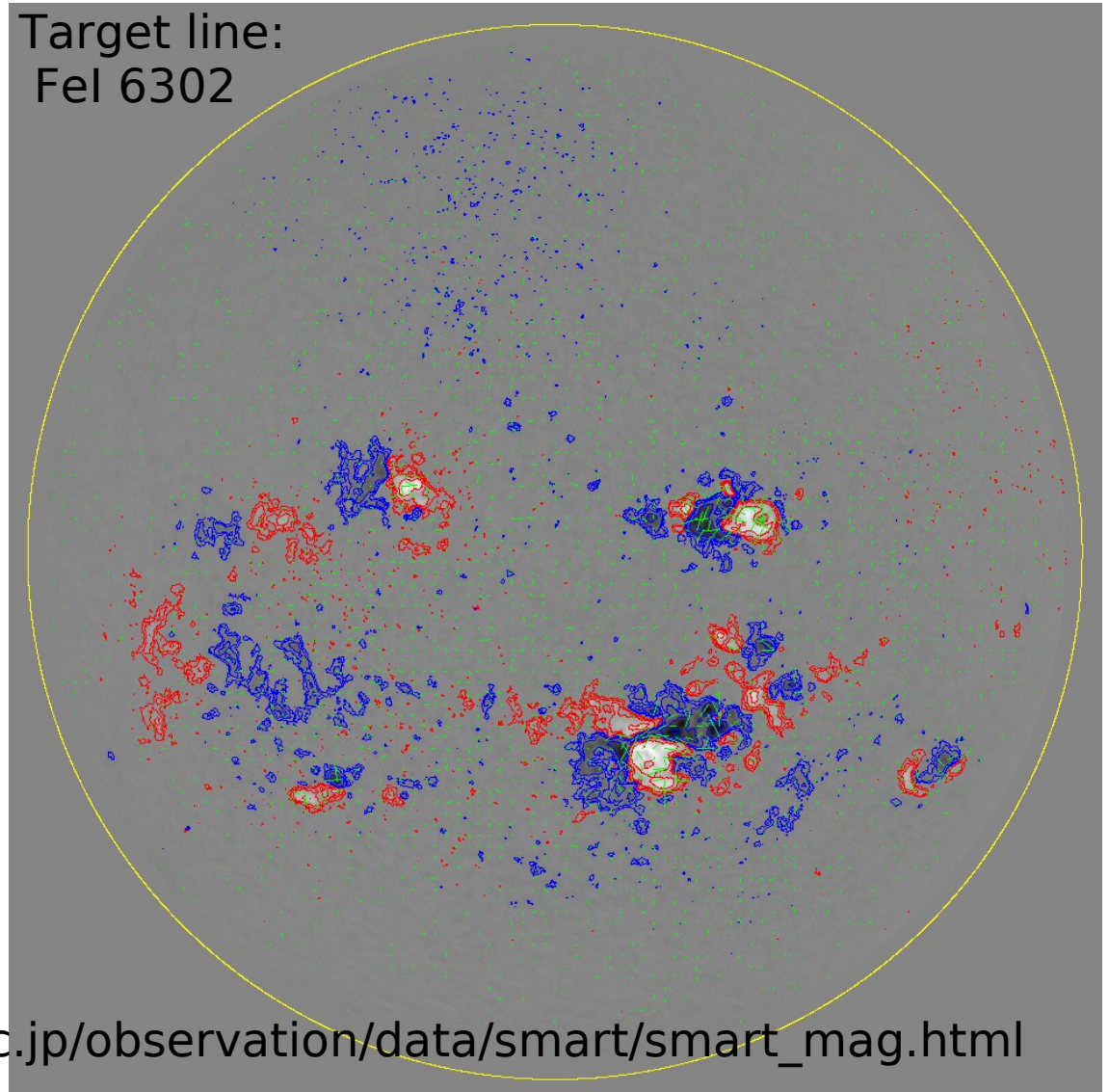
T2 (20cm dia.):

full disk image
pixel resolution $\sim 0.''6$
2k X 2k image
line scan
Lyot Filter

T4 (25 cm dia.):

partial frame \sim
pixel resolution
4k X 4k image
line scan
Fahrv-Perrot Filter

Target line:
FeI 6302



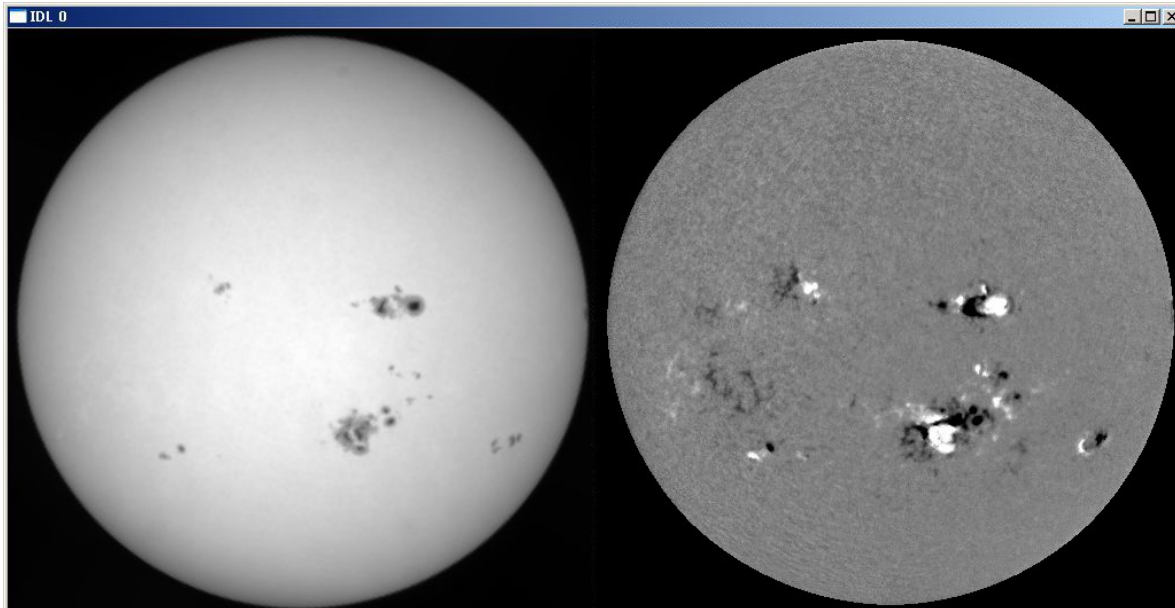
http://www.kwasan.kyoto-u.ac.jp/observation/data/smart/smart_mag.html

SMART T2 data



2003. 10. 30 02:19 UT

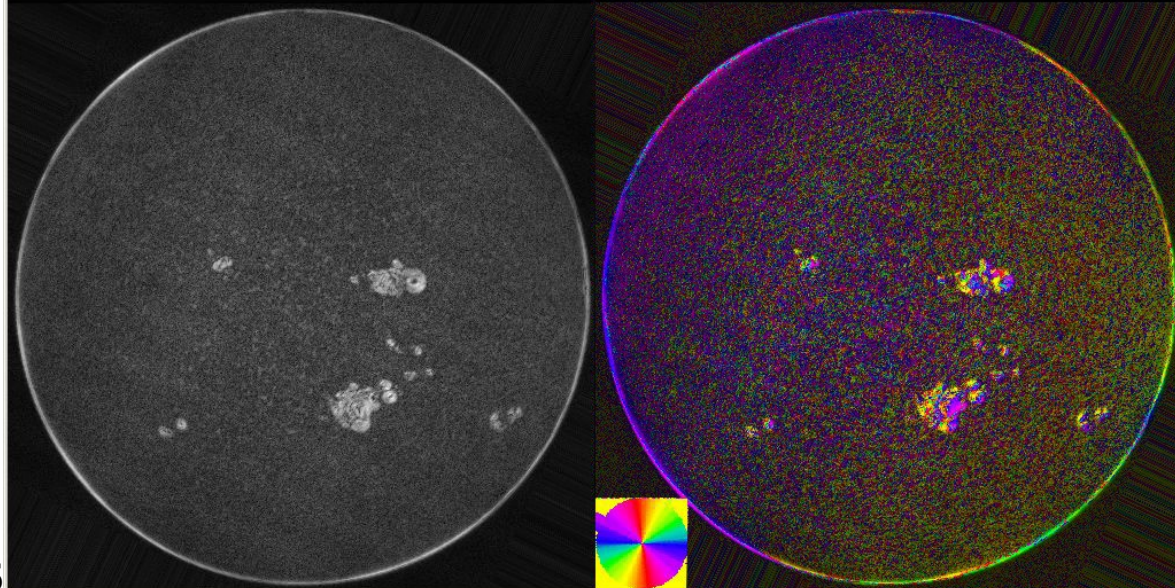
Intensity



$B_{\text{longitudinal}}$

39G (0<BI<1kG)
127G (1kG<BI<2kG)
201G (2kG<BI<3kG)

$B_{\text{transversal}}$



Azimuth
angle

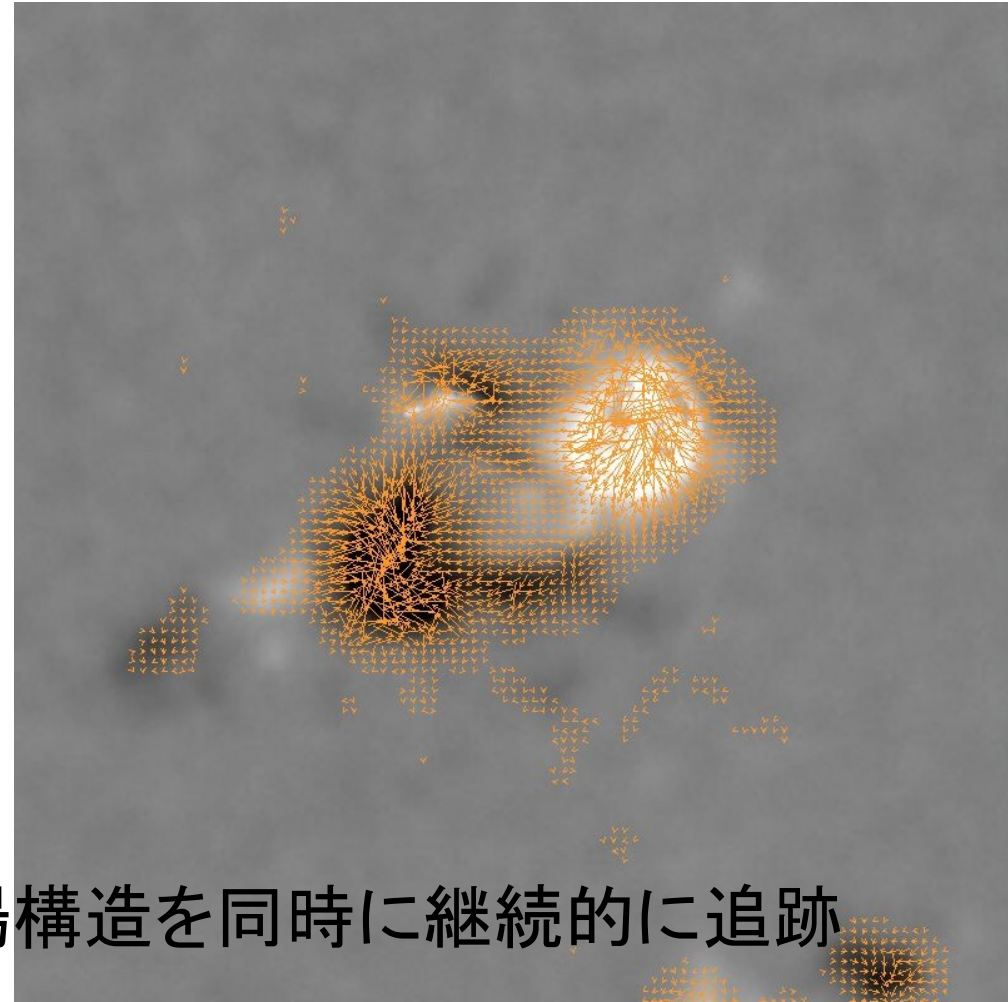
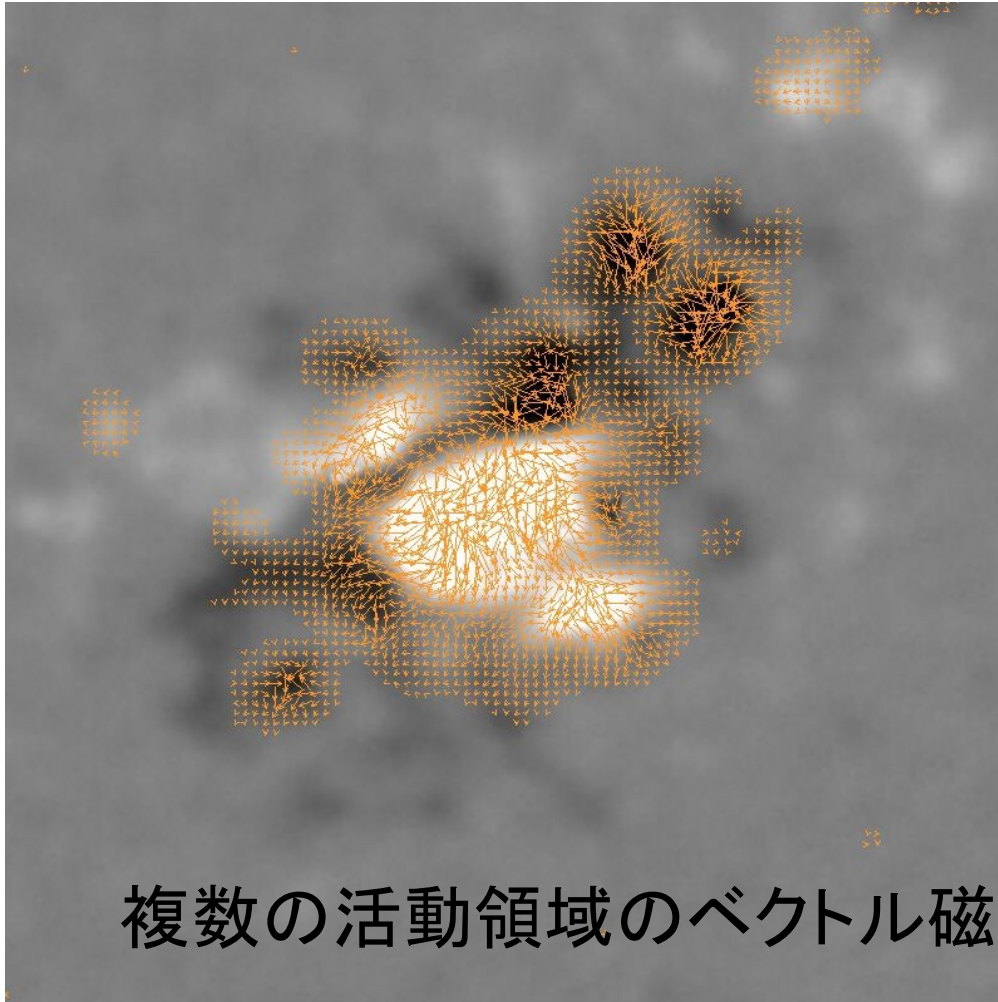
6.6deg. (0<B<1kG)
13.5deg (1kG<B<2kG)
13.7deg(2kG<B<3kG)

83G (0<Bt<1kG)
186G (1kG<Bt<2kG)
397G (2kG<Bt<3kG)

SOT17
April 17-20, 2006

NOAA 10486

NOAA 10488



複数の活動領域のベクトル磁場構造を同時に継続的に追跡



SMART data can be used for:

- Full disk images for monitoring ARs
 - Data can be used for SOT ROI selection
- What is going on outside of SOT FOV
 - Flare over whole AR can be covered; connectivity in large scale by SMART
 - SOT concentrate on the core of ARs

SMART and SOT



END