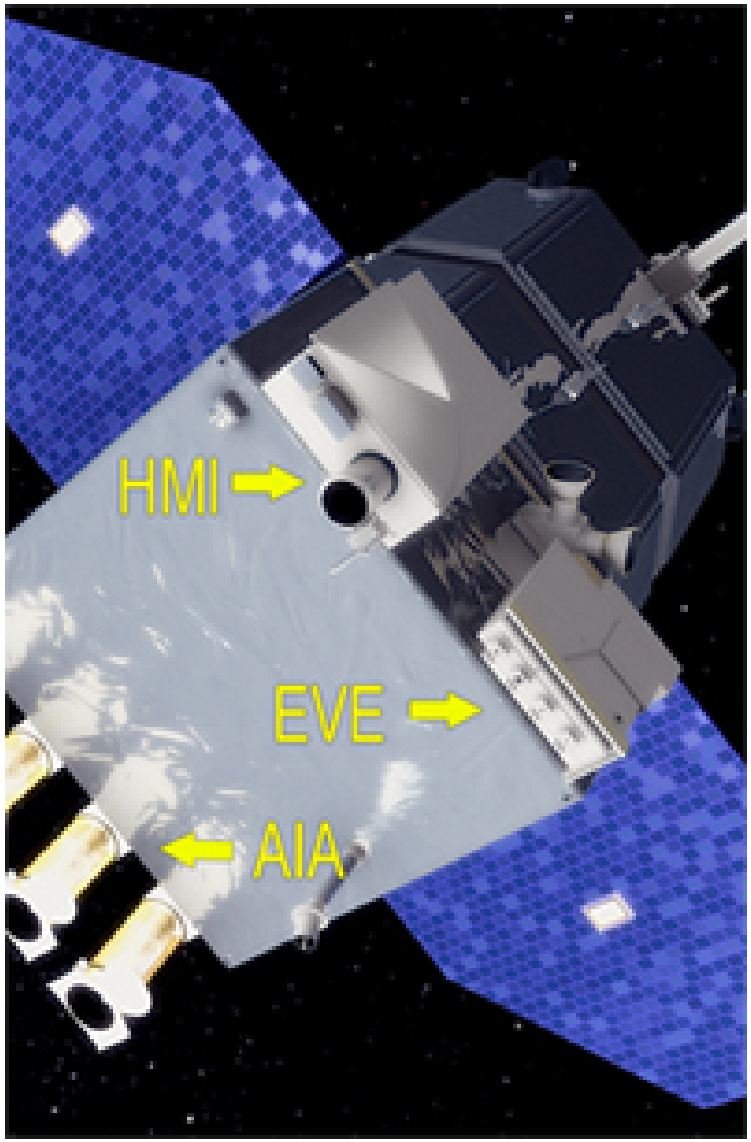


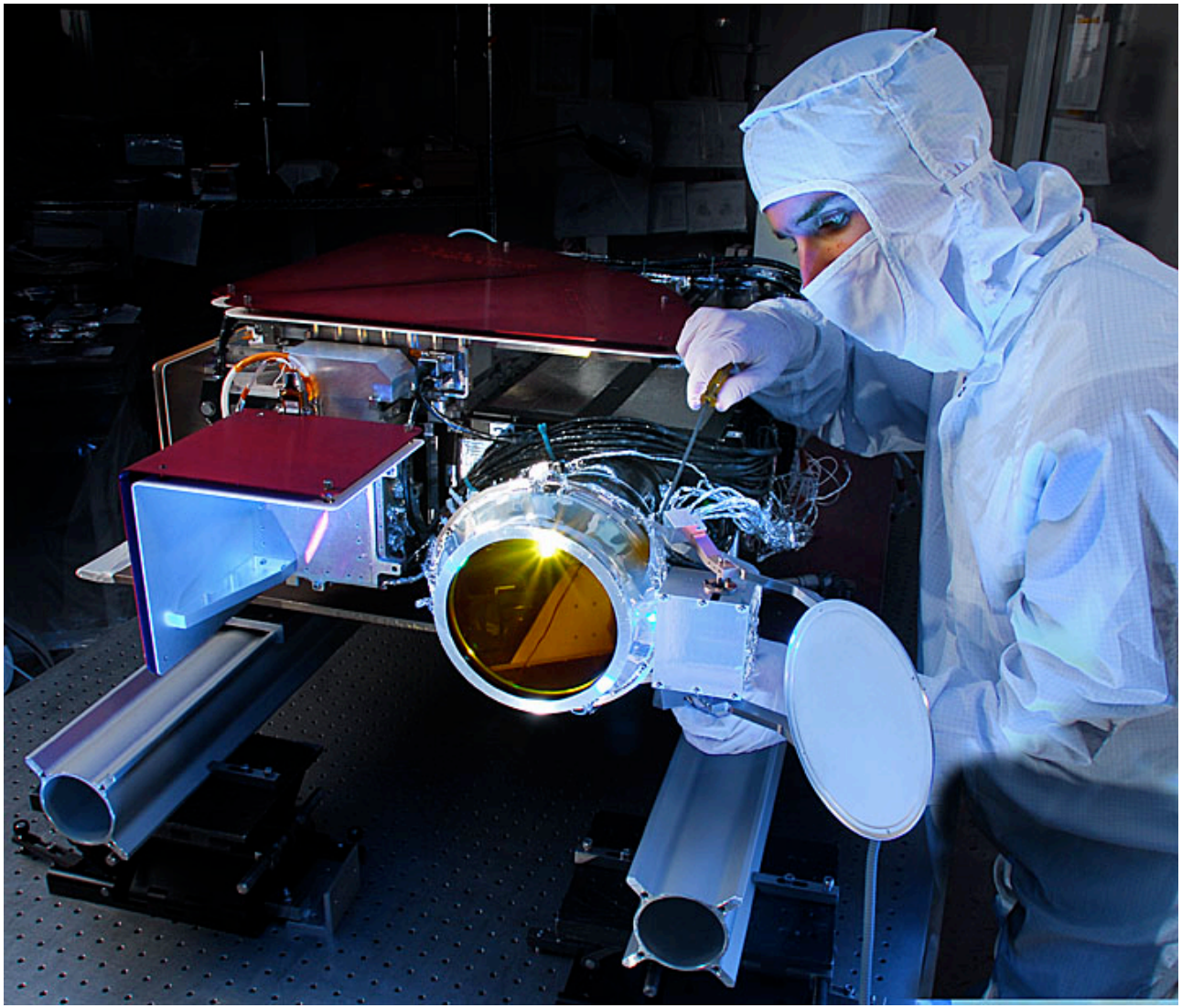

# Solar Dynamics Observatory
# Helioseismic & Magnetic Imager

Instrument Status

The Data Pipeline in general, and for Intensity Images in particular

Synergies with other (future) solar missions

# Instrument Status: Delivered to GSFC Nov 15, 2007



HMI: a "clone" of MDI,
with some exceptions...

a little better resolution

a little higher cadence

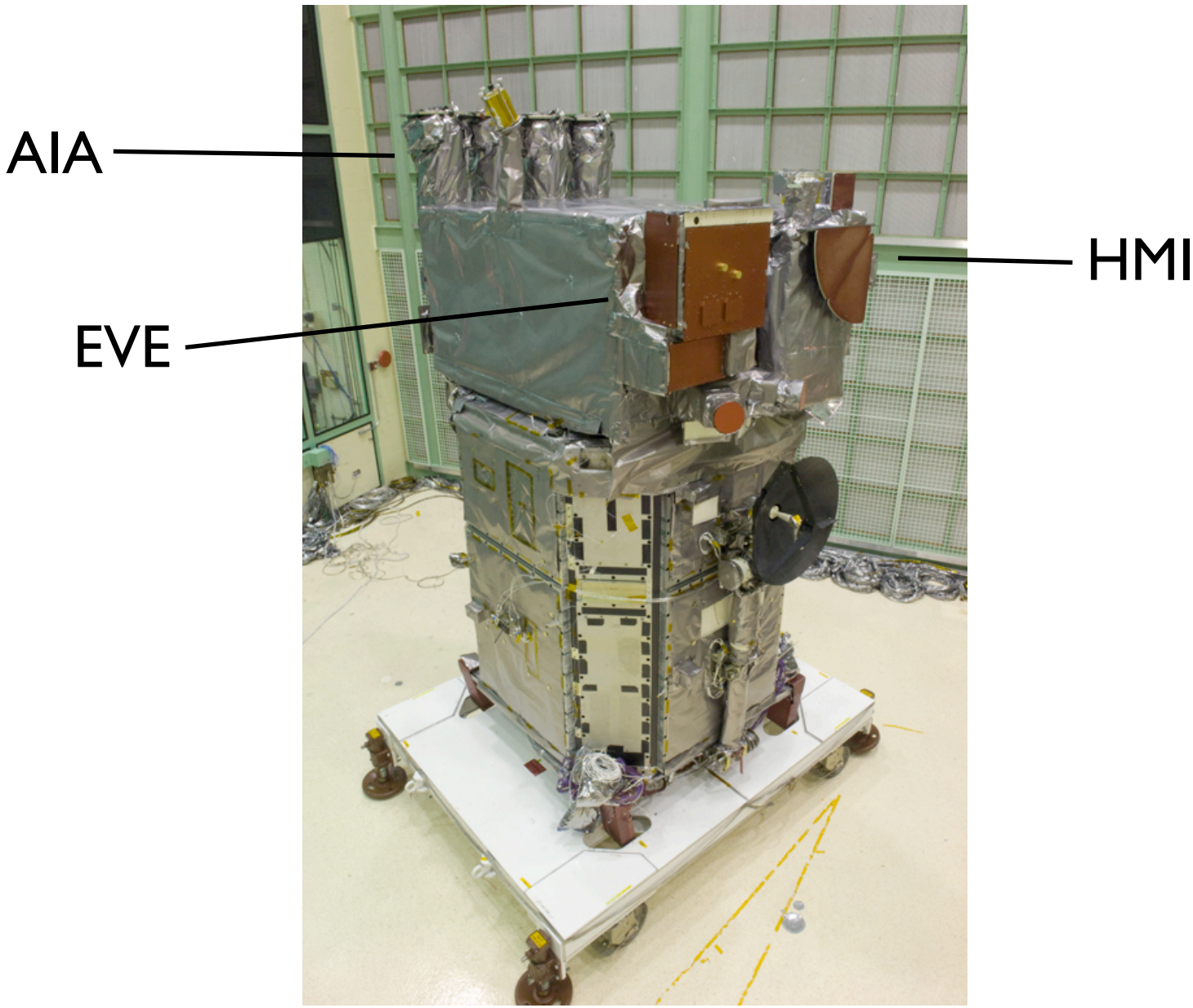
a few more observables

a lot more pixels

a lot fewer operating modes

a LOT more telemetry

# SDO Spacecraft Status: Integrated



# SDO Spacecraft Status: Awaiting Launch

but...


http://msdb.gsfc.nasa.gov/launches.php

Getting Started Latest Headlines

| | | | | | | |
|---|---|---|---|---|---|---|
| 5/25/2009 | ISS-19S | Russian Federal Space Agency | GN: DFRC, WGS, WSC; WAN | Soyuz | Russian Federal Space Agency | Baikonur |
| 6/23/2009 | SDO | NASA SMD | GN (WSC); SN (LEOP); WAN; [USN] | Atlas V | NASA SOMD | Cape Canaveral Air Force Station |
| **Launch UTC** | **Payload** | **Payload Customer** | **Payload Support** | **Launch Vehicle** | **Launch Vehicle Customer** | **Launch Site** |
| 6/24/2009 | ISS-34P | Russian Federal Space Agency | None | Soyuz | Russian Federal Space Agency | Baikonur |

http://www.nasa.gov/missions/highlights/schedule.html

Getting Started Latest Headlines

**2010 Launches**

**Date:** Jan. 26
**Mission:** SDO
**Launch Vehicle:** United Launch Alliance Atlas V
**Launch Site:** Cape Canaveral Air Force Station - Launch Complex 41
**Description:** The first Space Weather Research Network mission in the Living With a Star (LWS) Program of NASA.

# The Atlas V Launch Queue at Cape Canaveral

WGS SV 2 (military) – 5 12 2008

OTV-1 (military) – 26 02 2009

WGS SV 3 (military) – TBD

LRO/LCROSS – ≥24 04 2009

Intelsat 14 – spr 2009

SDO – 23 06 2009?

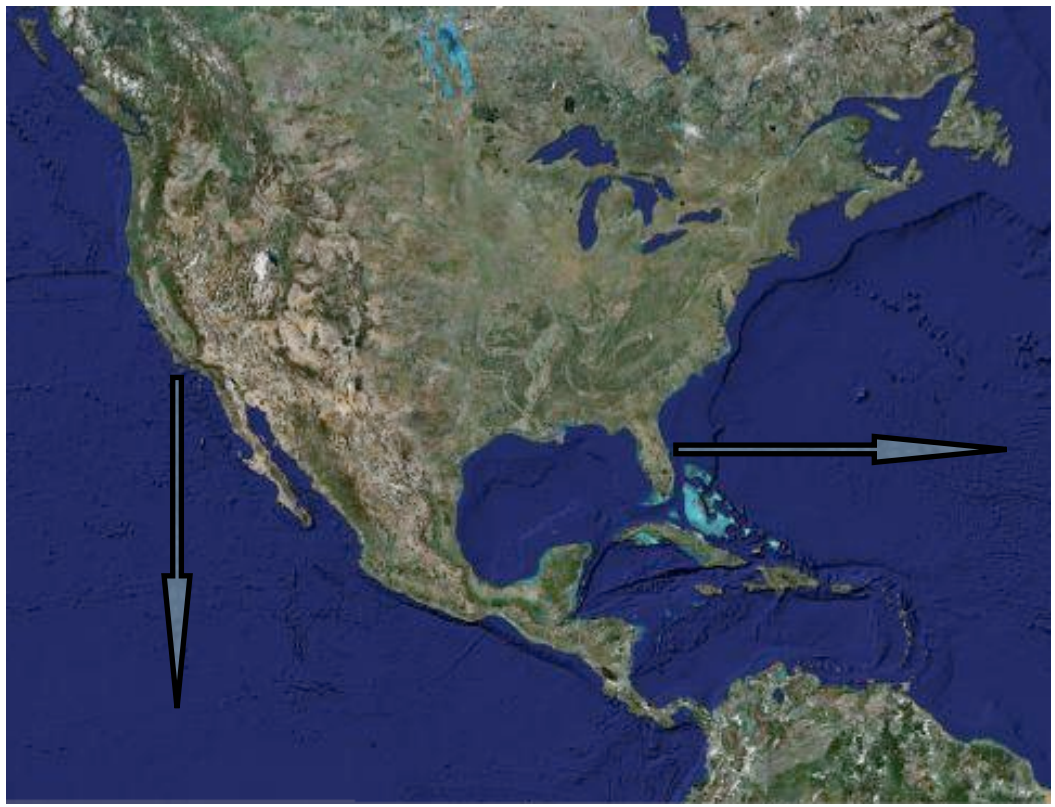
AEHF-1 (military) – 30 07 2009

GPS 2F-1 (military) – TBD

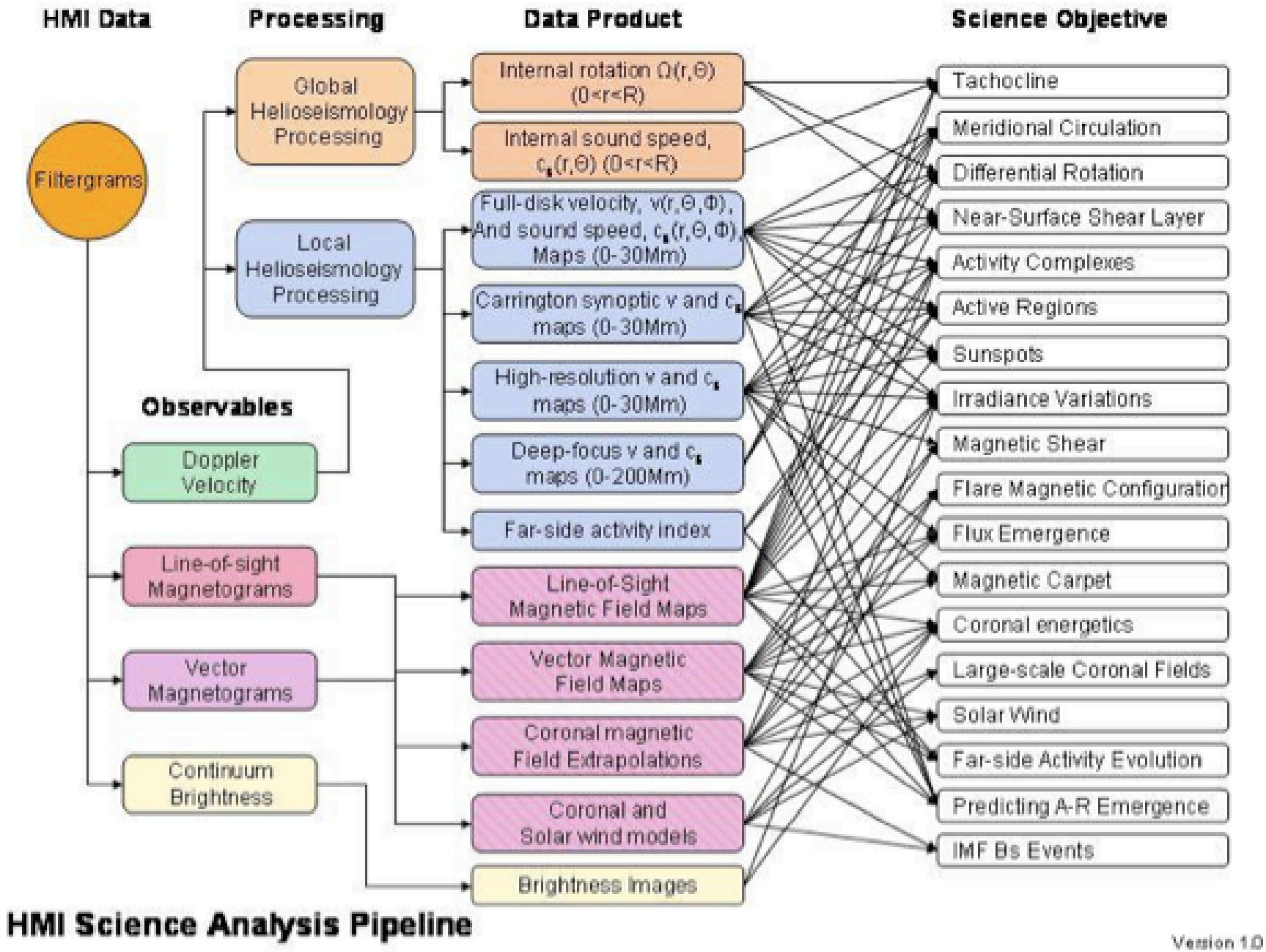
Mars Science Lab – ≥ 8 10 2009

SDO – 26 01 2010?

or...



# HMI: The Data Pipeline



# MDI Continuum Intensity
# Data Products for Global Seismology

– "LOI" macropixels: 180 regions, 1-min cadence, continuous

– also Doppler

– full-disc binned 8*8, 25-min smoothed, 16", 12-min cadence, continuous

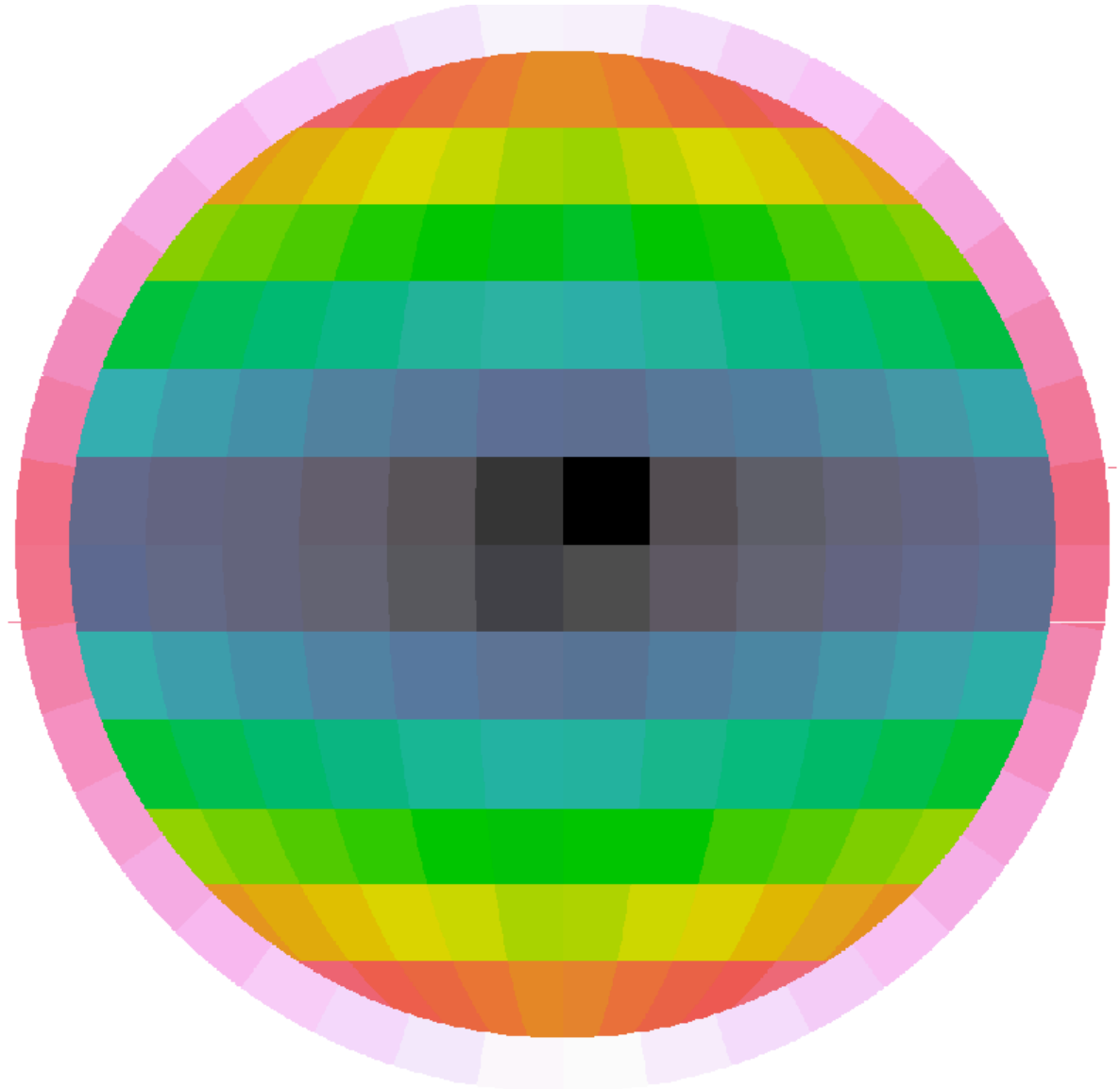
– also Line Depth

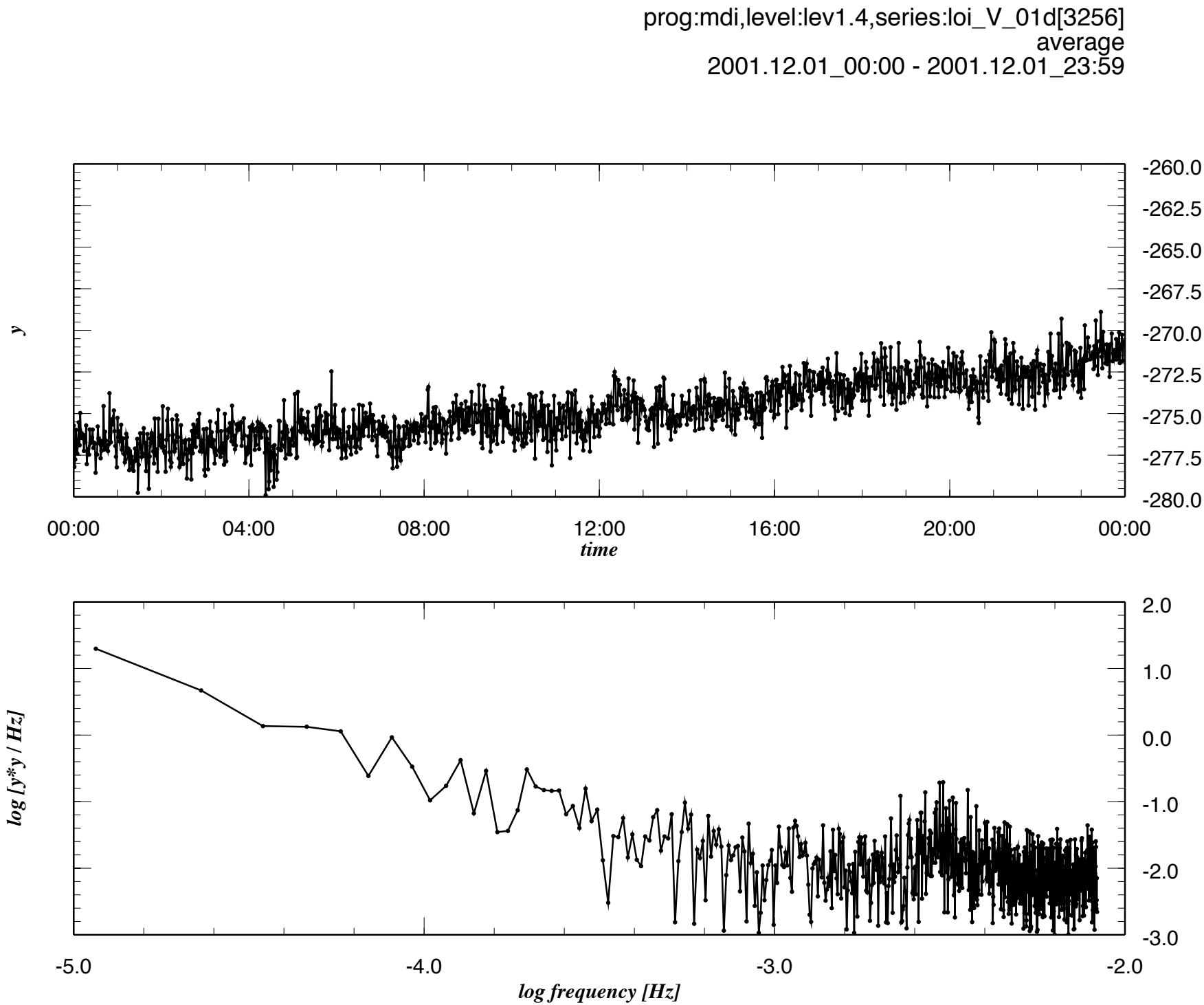
– full-disc 2", 1-min cadence, sporadic (continuous for 2 months in 1997, and occasional 3-day intervals)

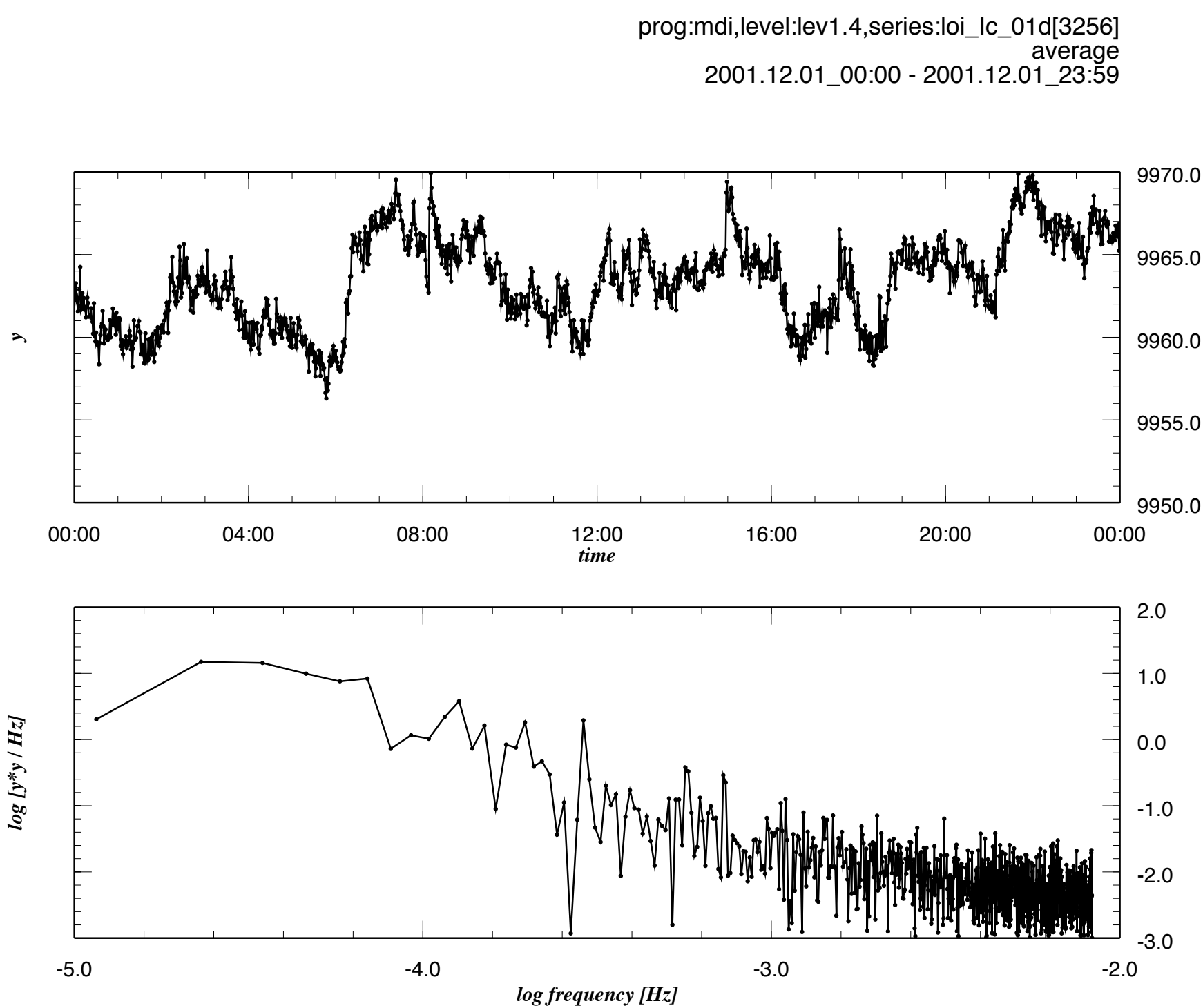
– also Doppler, Mag Field, Line Depth

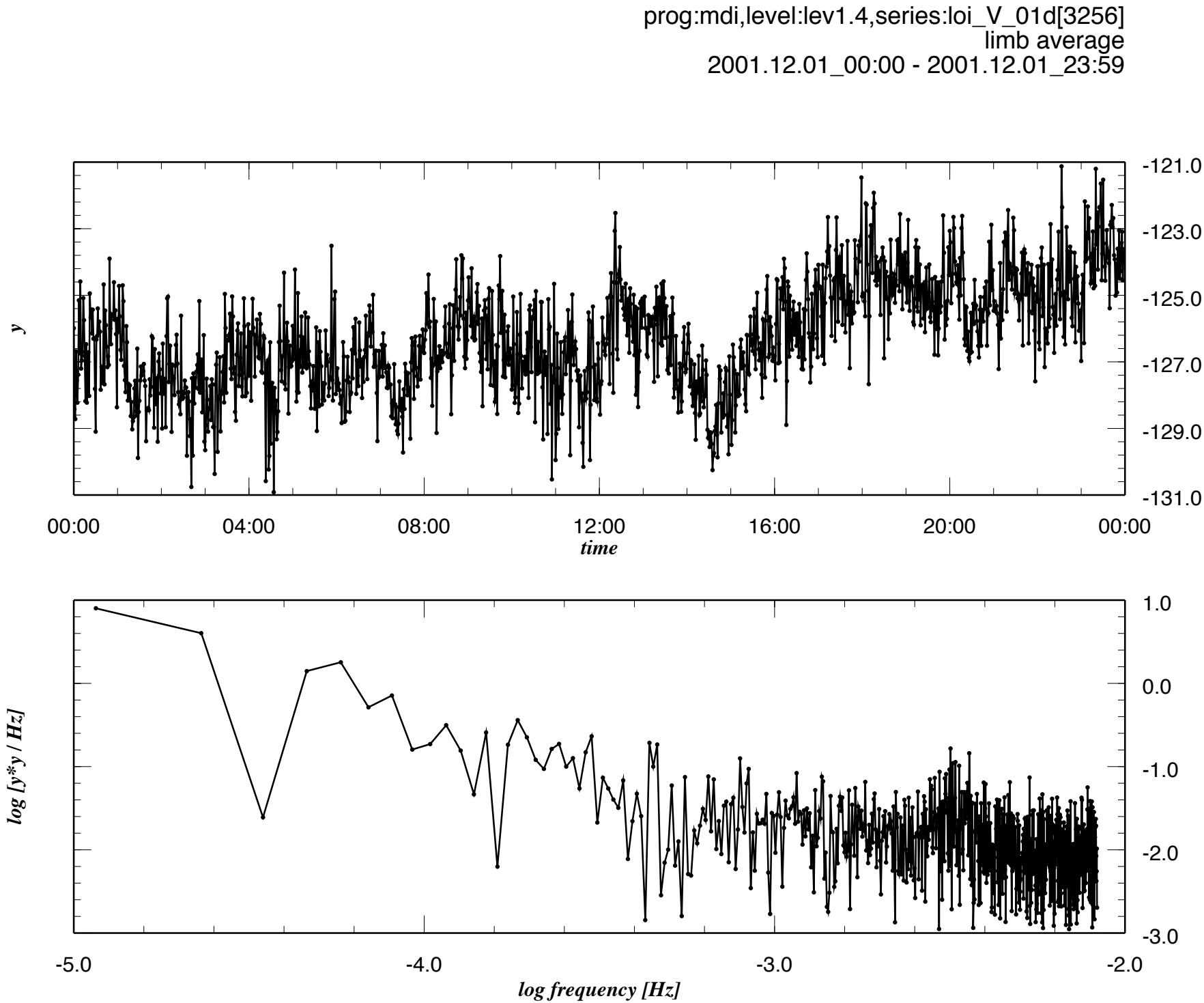
– limb pixels, 25-min smoothed, 2", 12-min cadence, continuous

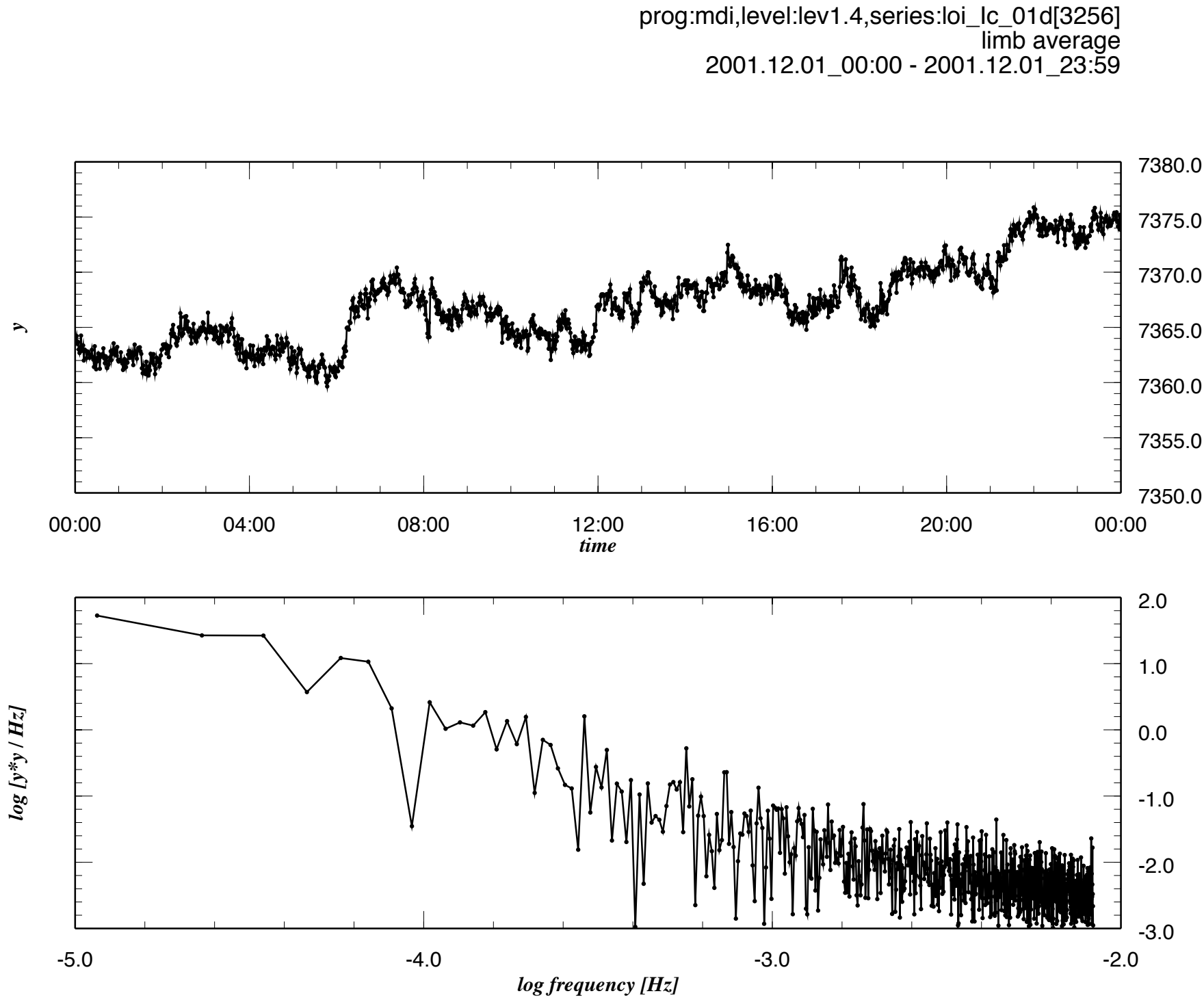
# MDI-LOI macropixel map

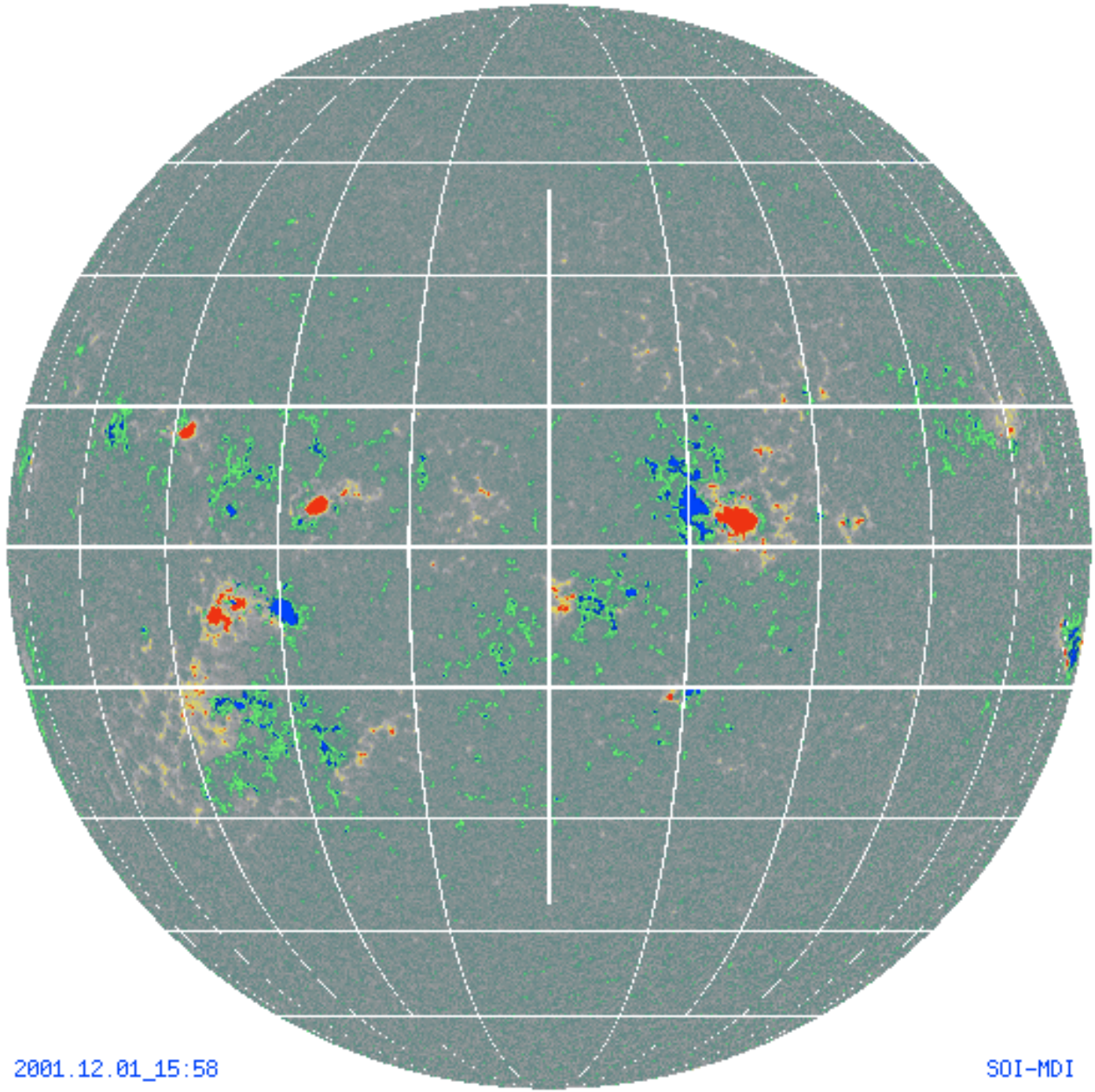



prog:mdi,level:lev1.4,series:loi_V_01d[3256]
average
2001.12.01_00:00 - 2001.12.01_23:59
y
-260.0
-262.5
-265.0
-267.5
-270.0
-272.5
-275.0
-277.5
-280.0
00:00
04:00
08:00
12:00
16:00
20:00
00:00
time
log [y*y / Hz]
2.0
1.0
0.0
-1.0
-2.0
-3.0
-5.0
-4.0
-3.0
-2.0
log frequency [Hz]


prog:mdi,level:lev1.4,series:loi_Ic_01d[3256]
average
2001.12.01_00:00 - 2001.12.01_23:59
y
9970.0
9965.0
9960.0
9955.0
9950.0
00:00
04:00
08:00
12:00
16:00
20:00
00:00
time
log [y*y / Hz]
2.0
1.0
0.0
-1.0
-2.0
-3.0
-5.0
-4.0
-3.0
-2.0
log frequency [Hz]


prog:mdi,level:lev1.4,series:loi_V_01d[3256]
limb average
2001.12.01_00:00 - 2001.12.01_23:59
y
-121.0
-123.0
-125.0
-127.0
-129.0
-131.0
00:00
04:00
08:00
12:00
16:00
20:00
00:00
time
log [y*y / Hz]
1.0
0.0
-1.0
-2.0
-3.0
-5.0
-4.0
-3.0
-2.0
log frequency [Hz]


prog:mdi,level:lev1.4,series:loi_Ic_01d[3256]
limb average
2001.12.01_00:00 - 2001.12.01_23:59
y
7380.0
7375.0
7370.0
7365.0
7360.0
7355.0
7350.0
00:00
04:00
08:00
12:00
16:00
20:00
00:00
time
log [y*y / Hz]
2.0
1.0
0.0
-1.0
-2.0
-3.0
-5.0
-4.0
-3.0
-2.0
log frequency [Hz]


2001.12.01_15:58
SOI-MDI

# Synergies with other (future) solar missions

| | |
|---|---|
| MDI | Best for cross-calibration, but short-lived |
| GONG | Similar to MDI, continuing, but ground-based, slow |
| Picard | Contemporaneous, space-based; data availability? |
| RHESSI | |
| Hinode | |
| Solar Orbiter? | |