

Second Announcement
Draft 2
The 2nd Vector Magnetogram Comparison Workshop
Oct. 19-21, 2010, Stanford University, Palo Alto, California

Data sets now available:

SOLIS:

Full Stokes spectra for July 1, 2010. The data are available at
ftp://solis.nso.edu/pub/solis/6302vScanlines_201007/20100701

These are Fe I 6302/6301A spectral lines. There are 2048 scanlines (FITS files) corresponding to steps as VSM scans solar image from south to north. Each scanline file has 4 spectra: I, V, Q, and U for spectrograph slit running East-West. VSM uses two cameras A and B (eastern hemisphere and western hemisphere of the Sun). On these spectra, gap between two cameras is removed. One should remember that SOLIS/VSM uses curved slit to scan solar image. Therefore, pixel coordinates along the slit need to be transformed if one wants to directly compare pixel-by-pixel profiles/inversion between, say, HMI/SDO and VSM/SOLIS or other instruments.

Please contact Alexei Pevtsov (apectsov@nso.edu) for help or comments

HMI:

In anticipation of the magnetogram comparison workshop we have identified a time interval in early July with data from multiple observatories and a sunspot. During that period AR 11084 is visible crossing central meridian and was observed by Solis, Hinode, and HMI. It was also visible in the MDI hi-res field of view.

HMI full-disk vector field inversions have been computed for at least a 60-hour interval, every 12 minutes, from 2010:07.01:12:00:00 - 2010.07.03:23:48

Thanks go to Keiji Hayashi, Sebastien Couvidat, Jesper Schou, and Rebecca Ceneno Elliot for getting this done. This is our best effort for the moment and includes cosmic ray detection and correction, the latest knowledge of the instrument filters, and our best estimates for the inversion parameters. It certainly still contains some easy to detect problems and that's something we'd love to hear about. These data have not yet been disambiguated. Perhaps that will happen before too long.

Please check the README file in <http://sun.stanford.edu/~todd/HMICAL/VectorB> for the most current information about the vector field data.

You can access this data through <http://jsoc2.stanford.edu/ajax/lookdata.html> [note the '2' in jsoc2].

The data series is `su_keiji.vmagf_2d_720s_5fltprf` [note that is a '5' not an 's' before `fltprf`]

If on the RecordSet Select tab you specify

`su_keiji.vmagf_2d_720s_5fltprf[2010.07.01-2010.07.04]` a list of the data will be found.

The data for one hour (5 inversions) on July 2 from 00:12 to 01:00 are available as fits files at

<http://jsoc.stanford.edu/SUM15/D88241899/S00000/>

For a longer time the fits files for one 12-min vector magnetogram at 2010.07.02_01:00 are available at

<http://sun.stanford.edu/~todd/HMICAL/VectorB/>

A line-of-sight magnetogram calculated from the same filtergrams is in the same directory.

A movie of the Btot can be found at <http://sun.stanford.edu/~keiji/outgoing/myplay/jul01.mpg>

For comparison a few nearby MDI images are available at:

http://mdisas.nascom.nasa.gov/gif_summary/mag/smdi_maglc_re_20100703_0014.gif

http://mdisas.nascom.nasa.gov/gif_summary/igram/smdi_igram_fd_20100702_1600.gif

http://mdisas.nascom.nasa.gov/gif_summary/mag/smdi_maglc_fd_20100702_1600.gif

Hinode images:

<http://soi.stanford.edu/~yliu/vectorcomp/HinodeBlos.20100702.1315.png>

<http://soi.stanford.edu/~yliu/vectorcomp/HinodeIc.20100702.1315.png>

You can find the IQUV data for HMI at <http://jsoc.stanford.edu/ajax/lookdata.html> in the series `hmi_test.S5_720s` or (older version) `hmi_test.S2_720s`.

Please contact T. Hoeksema (todd@sun.stanford.edu) or Yang Liu (yliu@sun.stanford.edu) if you have any comments, need help finding the data, or need access to `jsoc2`.

Simulations:

Bob Stein has kindly made a number of simulations available that are based on his MHD numerical code. He has provided synthetic IQUV profiles as “observed” by Hinode, along with the original magnetic and velocity fields for ground truth. The files are located at <http://steinr.pa.msu.edu/~bob/stokes/>

Confirmed Attendees:

Fischer

Centeno-Elliott

Hill

Pevtsov

Hoeksema

Harvey

Beck

Bommier

Schuck

Muglach

Stein

Bertello

Harker

Giampapa

Agenda:

Tuesday, October 19

8:00 am: Breakfast

8:45 am: Introductions and general remarks (Hill/Pevtsov//Hoeksema)

9:00 am: Status of SDO/HMI and SOHO/MDI (Hoeksema)

9:15 am: Status of HMI Vector data and processing (Liu/Centeno-Elliott/Leka)

9:30 am: Status of Hinode Vector data and processing (?)(could replace with MDI/GONG/Mt Wilson longitudinal status if needed)

9:45 am: Status of SOLIS Vector data and processing (Harvey/Pevtsov/Bertello)

10:00 am: Status of FIRS Vector data and processing (Lin/Jaeggli)(?) (could replace with Jack's Clint Eastwood impersonation)

10:15 am: Break

10:45 am: Discussion of data comparison issues:

- 1) Criteria for comparisons: how good is good enough?
- 2) How do we compare magnetograms observed at different wavelengths, different spatial scale, and different inversion techniques? Are these serious or minor issues? Will we ever be able to compare such "incomparable" magnetograms, or we are kidding ourselves?
- 3) Specific issues:
 - a. spatial resolution
 - i. to do with IQUV or inversion
 - ii. which method for spatial averaging to use
 - b. temporal resolution
- 4) What are the judgment criteria for "good" vs. "poor" correlation between two magnetograms? For example, scatter plots may show overall good correspondence, but some data points that deviate may occur in the vicinity of the sheared neutral line, which is characteristic of an incoming flare.

11:45 am: Organize afternoon tasks: Data comparisons

1. Comparison of IQUV spectra
2. Compare inversion results to show the effects of
 3. initial guess
 4. minimization technique
 5. other assumptions

Noon: Lunch

1:30 pm: Work on data comparison tasks

3:30 pm: Break

4:00 pm: More work on comparison tasks

5:30 pm: Adjourn

7:00 pm: Dinner at Fish Market

Wednesday, October 20

8:00 am: Breakfast

8:45 am: Discussion of Tuesday afternoon comparison results

10:15 am: Break

10:45: Simulated data introduction (Stein/Leka/Parchevsky)

11:15: Inversion pitfalls (Bommier/Leka)

11:45: Organize afternoon tasks: Inversion tests on simulated data

Noon: Lunch

1:30 pm: Work on inversion tasks

3:30 pm: Break

4:00 pm: More work on inversion tasks

5:30 pm: Adjourn

Thursday, October 21

8:00 am: Breakfast

8:45 am: Discussion of Wednesday afternoon inversion results

10:15 am: Break

10:45 am: Discussion of next steps:

- 1) Improvements: What, how, who, when?
- 2) Publications?

11:45 am: Final Remarks (Hill/Pevtsov//Hoeksema/Pesnell)

Noon: Adjourn