1. Level 2 IRIS data:

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iris_l2_20180529_183737_3600104031_SDO.tar : tar file with SDO cutouts in IRIS L2 SJI file format. See IRIS Technical Note 32 for details on these files

https://www.lmsal.com/iris_science/doc?cmd=dcur&proj_num=IS0452&file_type=pdf

iris_l2_20180529_183737_3600104031_SJI_1330_t000.fits : IRIS slit-jaw channels — one for each bandpass. See IRIS data analysis guide on how to use this data:
iris_l2_20180529_183737_3600104031_SJI_1400_t000.fits http://iris.lmsal.com/itn26/
iris_l2_20180529_183737_3600104031_SJI_2796_t000.fits
iris_l2_20180529_183737_3600104031_SJI_2832_t000.fits
iris_l2_20180529_183737_3600104031_raster.tar : tar file with the IRIS raster files. This is the spectroscopic data. Rasters 44 through 57 overlap in time with HiC
——

All of these are the level 2 IRIS data files, i.e., they are calibrated to our final data calibration level.

2. IDL save file with IRIS slit-jaw data re-scaled to HiC resolution, rolled to the same orientation and co-aligned in space and time.

The IRIS data has a spatial sampling of 0.33” per pixel, so I congridded the data to the HiC plate scale (0.129”/pixel) and used cubic=-0.5. The roll angle between IRIS and HIC is 1.7 degrees. I did nearest neighbor interpolation in time.
---
iris_sji_hic_aligned.idl
—

Do this in IDL:
restore,'iris_sji_hic_aligned.idl',/verb
% RESTORE: Restored variable: IRIS_ALIGNED.
% RESTORE: Restored variable: FULL_MAP_ALIGNED.

help,iris_aligned[1]
** Structure <16b9278>, 2 tags, length=1308828768, data length=1308825960, refs=2:
  DATA FLOAT Array[2056, 2040, 78]
  HEADER STRUCT -> <Anonymous> Array[78]
iris_aligned[0] contains SJI 1330, [1] for SJI 1400, [2] for SJI 2796, [3] for SJI 2832

.data contains the exact same FOV as HiC (2056x2040] with 0.129”/pix like HiC. But the data is the IRIS SJI. I padded the data with blanks because HiC has a larger FOV than IRIS. This has the same number of entries (78) as the HiC time series — but note that HiC has higher cadence than individual IRIS slit-jaw channels, so IRIS images are repeated, i.e., nearest neighbor sampling in time.

.header is the original header of the IRIS SJI. The coordinates/pointing information in these headers is only for informational purposes — it does NOT describe the actual pointing. In other words, I didn’t update the headers.

full_map_aligned is the same as the one that Sabrina provided in her maps. I have not touched it.

The coalignment between IRIS and HiC was done through:
- visual comparison of HiC 171 to AIA 171
- internal alignment from AIA headers of L1.5 for co-alignment between AIA 1600 and AIA 171 (using the AIA files in the SDO.tar file above — this includes the 3h cadence limb fitting AIA header information — should be better than the default but may still show internal co-alignment deviations of order 1 AIA pixel, i.e., several HIC pixels)
- visual comparison of AIA 1600 and IRIS SJI 1400

I did a visual check on some small kernels and found good correspondence, at least for the first and last of the HiC time series.

There might be some small drifts, but likely only a few HiC pixels.

3. Accompanying *.bcube files for easy visualization

---
hic_aligned.bcube
iris_aligned_1330.bcube
iris_aligned_1400.bcube
iris_aligned_2796.bcube
iris_aligned_2832.bcube
—
These are byte scaled movies in Oslo bcube format. They can be looked at with the nice movie-tool:
lp_ximovie, file1, afile2=file2
This allows blinking between different movies. Quite interesting stuff in the data (but that's for another email)
I think lp_ximovie is in the EIS solar soft tree.

The content of these bcube files is simply what is in the IDL save file iris_sji_hic_aligned.idl

4. IDL save file with HiC rolled onto IRIS frame, and co-aligned in space and time to the IRIS rasters

The IRIS rasters 044 through 057 were taken during the HiC data acquisition period. Since I would rather not rotate IRIS spectra to get onto the HiC frame, I decided to roll HiC to the IRIS frame so I can leave the IRIS rasters in their original format.

```
Restore,'iris_rasters_hic_aligned.idl',/verb
% RESTORE: Restored variable: HIC_IRIS_ALIGN.
% RESTORE: Restored variable: IRIS_SJI_ALIGNED.

help,hic_iris_align,/str
```

Contains .data: HiC data rolled by 1.7 degrees to IRIS reference frame.
I also copied over the time, dx, dy, xc, yc for reference purposes, but these should not be taken literally — I tweaked the FOV a little bit to make it match the IRIS SJI, so ignore xc and yc — again headers are not updated.
However, if you blink hic_iris_align.data with iris_sji_aligned.data you will get a good correspondence. Both have the same FOV and pixel scale.
iris_sji_aligned.data again contains the IRIS SJI data scaled to HiC FOV and pixel scale, but this time it is NOT rotated to HIC frame since HiC was rotated to IRIS reference frame.

Hic_iris_align also contains:
iris_raster_fname: array of 78 (one for each HIC time step) with file name of raster that is nearest neighbor in time to this HIC time step. Since the rasters take 25s, you will see repetition in this, but that is to be expected since HiC has higher cadence.
Iris_raster_index: same as above but just the index number of the raster that is nearest neighbor in time
iris_raster_fov: this is an array of 2x2x78, i.e., for each time-step it shows which FOV in HiC (i.e., in hic_iris_align.data) matches the FOV of the IRIS raster.

Example for time step 0:

```
    hic_fov=hic_iris_align.iris_raster_fov[*,*,0]
     mg2=fltarr(62,1413)
     si4=fltarr(62,1413)
     d=iris_load(hic_iris_align.iris_raster_fname[0])

    xpos=d->getxpos()
    dxpos=avg(xpos[1:*]-xpos[0:6])
    ypos=d->getypos()
    dypos=avg(ypos[1:*]-ypos)

     win2=d->getvar(2,/load)
     win6=d->getvar(6,/load)
     si4=congrid(rotate(total(win2[90:110,*,*],1),4),round(8.*dxpos/.129),round(dypos*548./.129)) ; sum over
```

whole Si IV line

mg2=congrid(rotate(total(win6[114:116,*,*],1),4),round(8.*dxpos/.129),round(dypos*548./.129)) ; sum over core of Mg II k line

Window,0, xs=500,ys=800&wset,0 &plot_image,mg2,min=0,max=3000

;;example for j=0

Window,2,xs=500,ys=800&wset,2 & j=0 & plot_image,hic_iris_aligned.data[hic_fov[0,0]:hic_fov[1,0],hic_fov[0,1]:hic_fov[1,1],j],min=0,max=50000

Blink,[0,2] ; will show pretty good correspondence in some moss regions — Mg II core is like H-alpha and H-alpha core and Fe IX 171 in moss show good correspondence (see, e.g., De Pontieu et al., 2003).