Hi-C 2.1 Data Levels User Guide

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1. Acknowledgement Statement

Please include the following acknowledgement statement in publications using the Hi-C 2.1 data set.

We acknowledge the High-resolution Coronal Imager (Hi-C 2.1) instrument team for making the second re-flight data available under NASA Heliophysics Technology and Instrument Development for Science (HTIDS) Low Cost Access to Space (LCAS) program). MSFC/NASA led the mission with partners including the Smithsonian Astrophysical Observatory, the University of Central Lancashire, and Lockheed Martin Solar and Astrophysics Laboratory.

2. Data Products

Hi-C_2.1 >
    Calibration
        (Master Dark, Master Flat, Bad Pixel Map)*
    Level0
    Level0.5
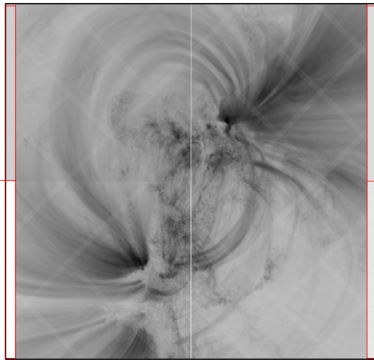   Level1.0*
    Level1.5*
    maps
    User_Guides*
    good_bad_indices* (See section 4.c.)

* Readily available through the VSO. Otherwise available by request (Sabrina dot Savage at nasa dot gov or Amy dot R dot Winebarger at nasa dot gov).
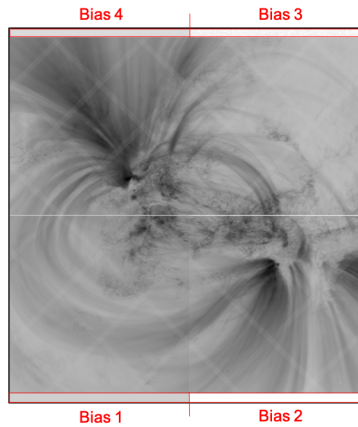
3. Graphic Summary of Basic Level Outputs

Level 0

Raw
Incorrect Times
Incorrect Header Info
Incorrect Orientation

Level 0.5

Level 0+
Rotated 90 deg CCW
Time stamp corrected
Header coordinates updated
    Center coordinates updated
      (including rotational drift)
    Fine co-alignment shifts
      incorporated
Corrected and expanded
    header Info

Level 1.0

Level 0.5+
Master Dark-Subtracted
Bias-Subtracted per quadrant
    using non-active pixels
    (quadrant bias levels
      added to header)
Flat-fielded to remove grid
Cleaned of bad pixels & dust
Cropped to remove side non-
    active pixels and center
    overscan regions
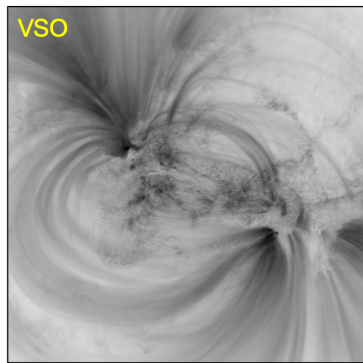
Level 1.5
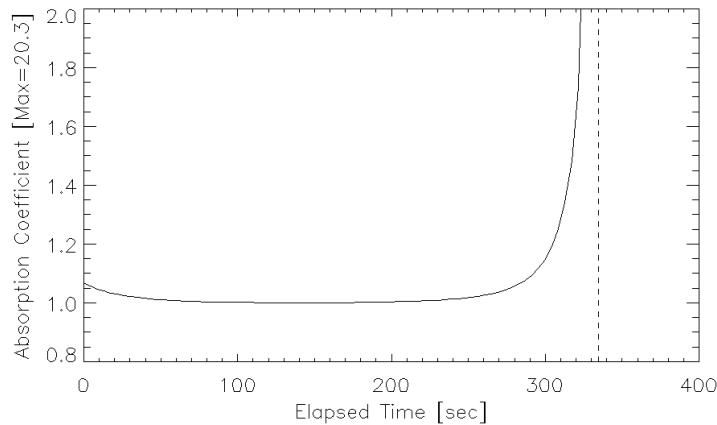
Level 1.0+
Shifted to be co-aligned based
    on header coordinates and
    with tracking applied
Absorption-compensated
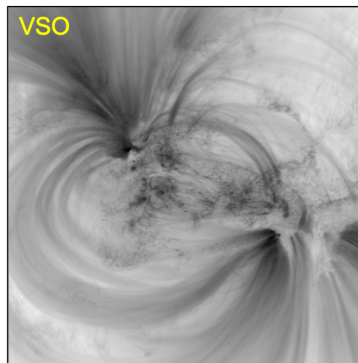
4. Additional Notes

a) Atmospheric Absorption

The absorption coeffients are calculated empirically and are added to the Level 1.5 headers under the keyword abscoef. The images are compensated by multiplying the counts by these values.

b) Gain

Counts are in units of Data Number. The gain is approximately 2.5 electrons / DN. More precise gain measurements are available upon request.

c) Jitter

There is substantial jitter from the rocket in about half of the frames. We are working to de-smear these images; however, in the meantime, arrays of good and bad indices are provided with the data as 'good_bad_indices.sav'.

IDL> restore, 'good_bad_indices.sav', /v

→ Arrays = goodis and badis

e.g., goodmap15 = hic21_l15_map[goodis]

-or-

IDL> mreadfits, fits_files, index, data

IDL> index = index[goodis] & data = data[*,*,goodis]