SECCHI Status

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Presentation to STEREO SWG

22 March 2004

Boulder, Colorado

Outline

- Instrument Status
- Data Products
- Data Display
- Beacon Data
- Observation Timing
- First Light Press Releases
- 3D Visualization Status

Instrument Status

- Flight Hardware Development Is Well Underway
  - Delivered:
    - Flight Shutter and Polarizer/filter Wheel Mechanisms
    - Flight Focal Plane Assemblies With Ccds
    - SCIP Bench
  - “First Light” on FM EUVI and COR2 Telescopes
  - MEB, CEB in Unit Level Environmental Testing
  - Final Fabrication: COR1, GT, SEB
  - HI Well Underway
- Manufacturing Problems Have Caused Extensive Replanning of Schedule
  - E.G. Coating Problems in All Countries Have Been Surprising
  - Fab of PC Boards Has Shown Lifting of Traces
- Mass Is a Major Issue
  - SCIP Bench Has Measured More Than Expected
  - Harness Between Electronics and Telescopes Is Longer (Heavier) Than Estimated

Instrument Performance Status

- **No descoping of instrument performance has occurred in parameters that have been measured to date**

- **No descoping is forseen**

Data products

- Catalogs and FITS Images of the Data
- Movies
  - Multipanel Synchronized to 2 (3?) Spacecraft and Multiple Sensors
  - Anaglyph
  - Formats (2Kx2K and 1Kx1K)
    - GIF/PNG, MPEG I or II
  - Must Meet Needs of Amateur Comet Hunters
- Synoptic Maps Showing Intensity at Selected Heights
- Lists (Automatically Generated)
  - CME, Prominence or Filament Eruption, Disappearance
  - Coronal Holes, UV Waves and Dimmings
  - Total Flux in EUV

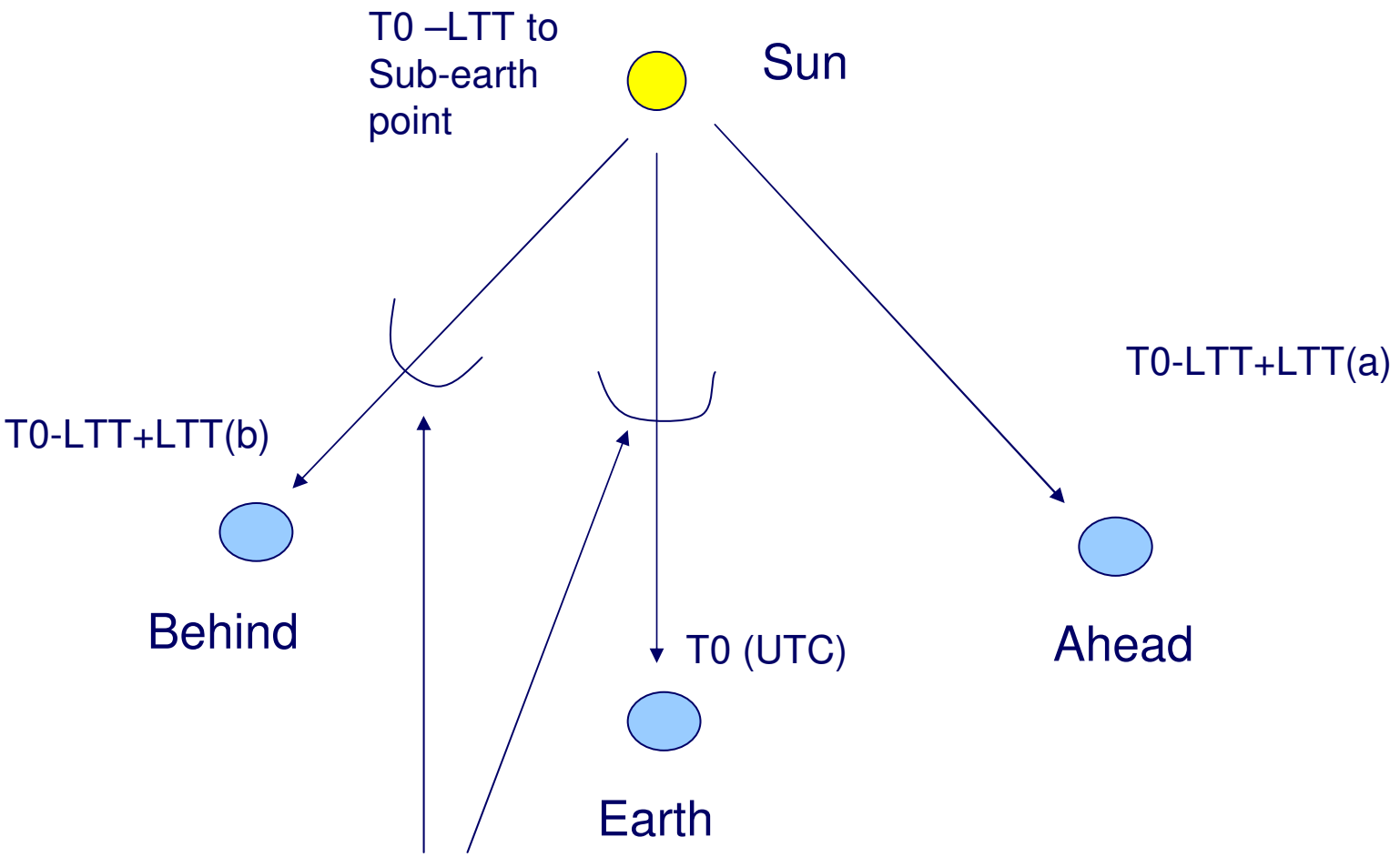
Data Display

- Display Capabilities
  - Anaglyph Prints Viewed With Red/blue Glasses
  - Stereo Image Pairs Viewed on Crt/projector With LCD Goggles
  - Coronal “Fly Through”
  - Orbit Display With Planet Locations
  - Movies From Up To 3 Locations
  - Inset of One Image Type Into Another Type
- STEREO Browser
  - Interface to Instrument Databases Is Via VSO Data Query
  - Thumbnails Customizable by User to Incorporate Any VSO Compatible Data Set
  - Should Display All the Instruments Plus Modeling Output (S) Tying Remote Sensing to In-situ

Beacon Data

- NOAA Is the Prime User
- Objective Is to Provide Sufficient Visibility to
  - Identify When CME Has Been Launched Toward Earth
  - Track CME Through Space
  - Provide a Warning and Then Better Indication of Impact
- Software (Ground)
  - Reconstitute (Low Resolution) Image
  - Background Removal
  - Automatic Detection of CME.
    - During Extended Phase – Automatic Detection Will Be Performed On-board
  - Reformat to Utilize Existing CME Measuring Software
- Data Type
  - Reduced Resolution Images
  - Exact Definition Is Uploaded at the Time of Operations (Weekly)

Observation Timing



Need to be able to synchronize observations based on actual location of the CME

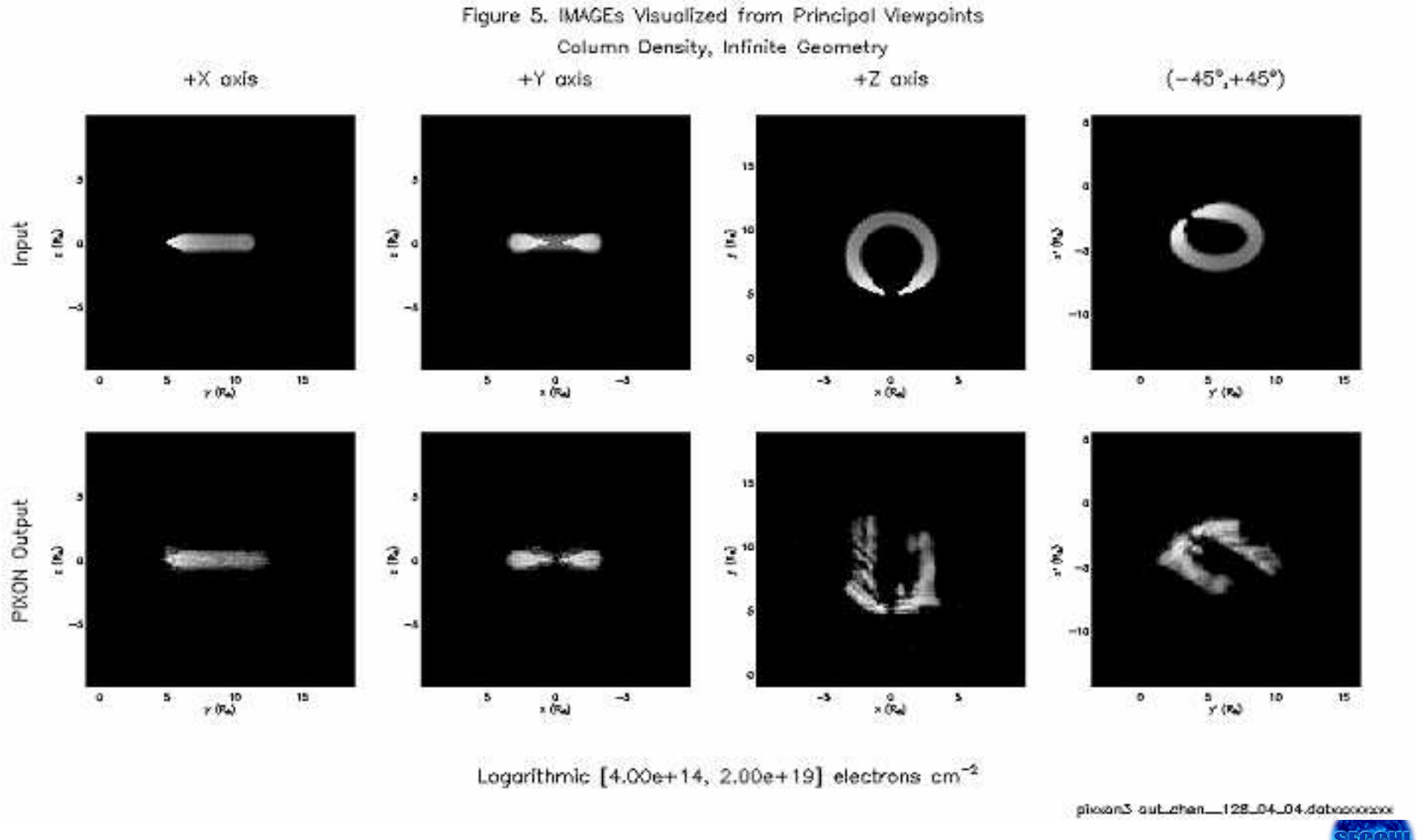
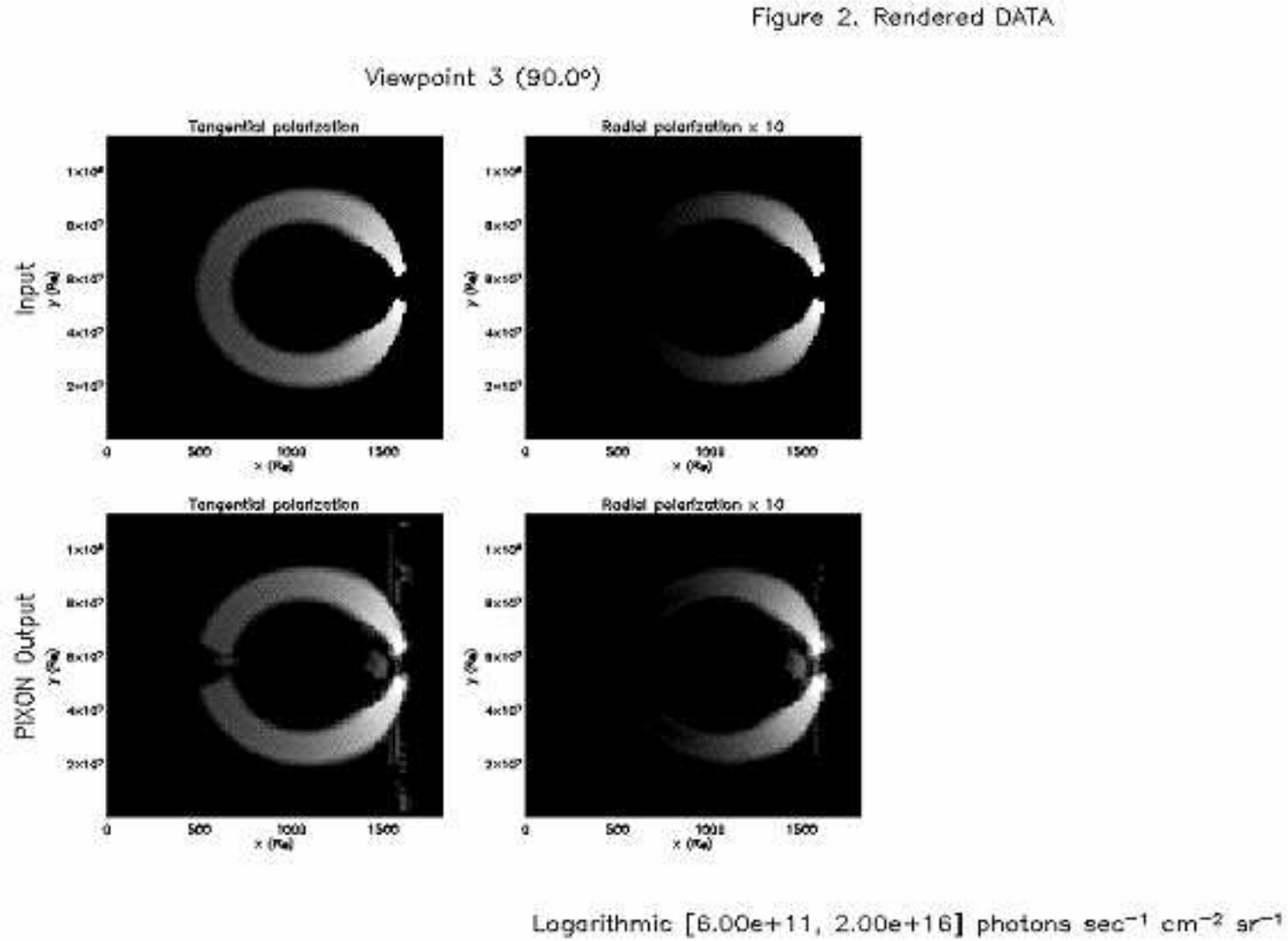
“First Light” Press Releases

- Topics Under Consideration
  - 3D Deconvolution of EUV Structures
    - Loops, Prominence
  - 3D Deconvolution of Coronal Structure
    - Streamer, Coronal Hole, Polar Plumes, Cmes
      - Good Opportunities Apt to Be Present Immediately Except for Cmes, for Which a Good Opportunity Might Not Be Present for Some Time
      - Would Involve 1-5 Days of Observations
  - 3D Deconvolution of Streamer Belt and the Inner Heliosphere
    - Would Involve 14-27 Days of Observation
    - Could Include All Stereo Instrument Data Plus Modeling
- Data Must Be Embargoed Before Release
  - Implies That 1st Observations Should Not Be Put Onto Web Immediately
- Public Interest in Data Is Greatly Enhanced If They Are Real-time. The Interest Is Lessened the Less Real-time It Is. Therefore We Must Prevail on APL to Make the Data Available Quickly

3D Visualization

- 3D Deconvolution
  - Pixon Method Chosen for Speed (Large # Voxels, up to 10^9): Small Number of Iterations, Intelligent Guidance to Declining Complexity Per Iteration. Sample Times Have Been 32x32x32 <15 Minutes, 64x64x64 ~60 Minutes, 128x128x128~6 Hrs, (1 Ghz PC).
  - Minimum Complexity: With This Underdetermined Problem, We Make Minimal Assumptions in Order to Progress. Another Possibility Is Forward Modelling, I.E. Parameter Fitting. Complementary Approach.
  - Received Cme Models From J. Chen, P. Liewer, S.T. Wu and Z. Mikic, and Have Used Them to Generate a 3D Reconstruction
  - Example of the Results of the Deconvolution for the Chen Model Are Shown in the Next Slide
  - Future Work
    - Continue Refining Reconstruction Algorithm, I.E. Hierarchical Gridding
    - Continue Investigating Range of Density Structures Vs. Signal-to-noise.
    - Use Lasco/eit Data for Rotational Tomography.
    - Time Dependent Reconstructions
- Forward Modeling Program Using Conceptual Structures Is Underway

3D Reconstruction: CME model (J. Chen) Three Ecliptic Viewpoints



2 Views in Ecliptic and 1 Above Ecliptic