Doug Biesecker

NOAA/Space Environment Center
Beacon Ground Station Network

• Almost together
  – CNES – signed letter of agreement received
    • Toulouse – 9m
  – NOAA – interdepartmental memo received
    • Wallops Island – 13m
    • Fairbanks – 13m
  – Japan likely the fourth
  – Others for backup/outyears
    • RAL
    • Australia/ACRES
    • USAF

• NOAA ‘interested’ in tracking STEREO as long as possible – fill the ‘GAP’ between SOHO and a NOAA Coronagraph (yeah, right)
Data Flow

• s/c testing
  – P. Karn’s Viterbi decoding software ready to be tested

• Turbo encoding
  – Desired due to Eb/No
  – Licensing issue likely completed soon
  – The lawyers are talking
    • Down to who has jurisdiction in disputes

• Data transfer to SSC - swx_ingest
  – Testing to take place in January from SEC to SSC
DATA BROWSERS and VIEWERS

• **SSC Beacon Data pages** – links to other browsers?
  • **Solar Weather Browser** B. Nicula, D. Berghmans, R. van der Linden ROB
    – Uses fast internet access & caching.
  • **STEREO Key Parameters** C. Russell & IMPACT, PLASTIC & SWAVES teams UCLA
    – An easily browseable Merged Key Parameter data display including the in-situ & SWAVE radio data from STEREO.

• **Carrington Rotation In-situ Browser** J. Luhmann, P. Schroeder UCB
  – Browser for identifying in-situ events & their solar sources at CR-time scales.
  – Includes near-Earth (ACE) data sets for third point views & image movies from SECCHI & near-Earth (SOHO).

• **JAVA-3D Synoptic Information Viewer** J. Luhmann, P. Schroeder UCB
  – JAVA-3D applet for viewing 3D Sun & solar wind sources based on synoptic solar maps & potential field models of the coronal magnetic field.
3-D IMAGING TOOLS

• **Tie Point Tool** E. DeJong, P. Liewer, J. Hall, J. Lorre  JPL
  – Manually create tiepoints between features in SECCHI image pair & solve for 3D location in heliographic coordinates.

• **Geometric Localization Of CMEs** V. Pizzo, D. Biesecker NOAA
  – Tool utilizing a series of LOS’s from two views to define the location, shape, size and velocity of a CME.
  – To be automated & used to decide whether and when a CME will impact Earth.

• **3D Structure of CMEs** V. Bothmer, H. Cremades, D. Tripathi MPI, Ger.
  – Program to compare analysis of SECCHI images on the internal magnetic field configuration & near-Sun evolution of CMEs with models based on SOHO observations.
  – Forecast flux rope structure; 3D visualization of CMEs.
AUTOMATED DETECTION and IDENTIFICATION

• **Computer Aided CME Tracking (CACTus)** E. Robbrecht, D. Berghmans, G. Lawrence, R. van der Linden ROB
  – Near-realtime tool for detecting CMEs in SECCHI images.
    • Outputs: QL CME catalog w/measures of time, width, speed; NRT CME warnings.
  – Successfully tested on SOHO LASCO CMEs.

• **Computer Aided EUVI Wave & Dimming Detection** O. Podladchikova, D. Berghmans, A. Zhukov ROB
  – NRT tool for detecting EUV waves & dimming regions.
  – To be tested on SOHO EIT images.

• **Velocity Map Construction** J. Hochedez, S. Gissot ROB
  – Program to analyze velocity flows on SECCHI images; detect CME onsets & EUV waves; NRT warnings of fast CMEs; reconstruct 3D velocity maps of CMEs from 2D maps from each STEREO.

• **Automatic Solar Feature** D. Rust, P. Bernasconi, B. LaBonte, JHU/APL
  – Tool for detecting and characterizing solar filaments and sigmoids
  Recognition & Classification in solar images. Goal is to meas. magnetic helicity parameters & forecast eruptions using filaments & sigmoids.
HELIOSPHERIC STUDIES

• **WSA Model Predictions** N. Arge, J. Luhmann, D. Biesecker AFRL, UCB, NOAA
  - The Wang-Sheeley-Arge and ENLIL 3D MHD solar wind models will be integrated
  - Provide routine predictions of vector s.w. velocity, polarity, s.w. density & temp. anywhere you like

• **Identifying & Tracking CMEs with the Heliospheric Imagers** R. Harrison, C. Davis RAL
  - Produce simulations to show model CMEs can be identified & tracked with the HIs.
  - Use triangulation to measure speed & direction of CMEs & forecast their Earth arrival.

• **Structural Context of Heliosphere Using SMEI Data** D. Webb, B. Jackson BC/AFRL, UCSD
  - Use analyses of SMEI images to provide structural context of the heliosphere for STEREO HI
  - Also provide complementary observations of transient disturbances.

• **Interplanetary Acceleration of ICME’s** M. Owens BU
  - Construct acceleration profiles of fast ICMEs over a large heliocentric range using multi-poHI to understand the forces acting on ejecta in interplanetary space.
  - Improve predictions of arrival times of ICMEs at Earth.

• **Relationship between CMEs and Magnetic Clouds** S. Matthews, MSSL
  - Assess the potential geoeffectiveness of CMEs based their association with magnetic clouds.
  - What particular characteristics lead to production of a magnetic cloud?