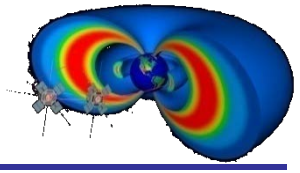


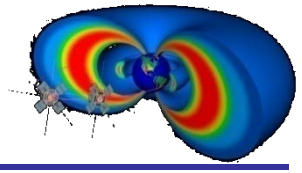
RBSP
Radiation Belt Storm Probes

EMFISIS
Science Investigation Status

Craig Kletzing
University of Iowa

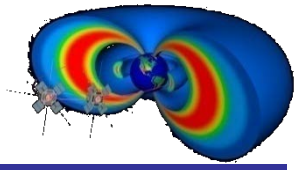
SWG Meeting
20-21 October 2011

EMFISIS Status



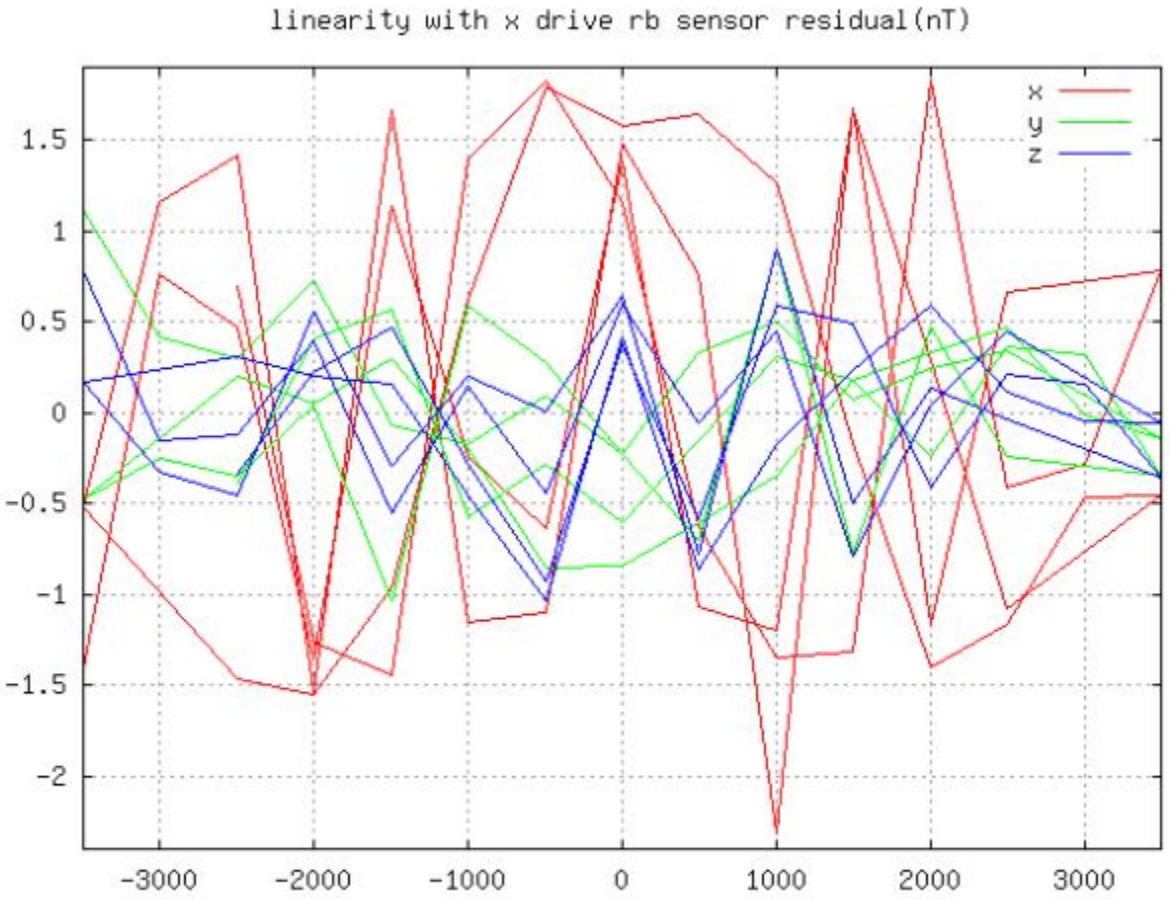
- Instruments delivered in late April, 2011, successfully integrated onto both spacecraft in early May, 2011
- All EMFISIS hardware working without problems.
- EFMISIS team has worked closely with APL on a variety of tasks:
  - testing of spacecraft data flow and CPTs.
  - aided mechanical team to determine boom properties:
    - Boom CM
    - Appropriate balance mass
  - tracking down noise sources on the spacecraft.
  - environmental test planning: EMI, vibe, and thermal vacuum.
- Timing testing results: EMFISIS timing is <1 ms through the entire measurement/TM chain.

MAG Calibrations

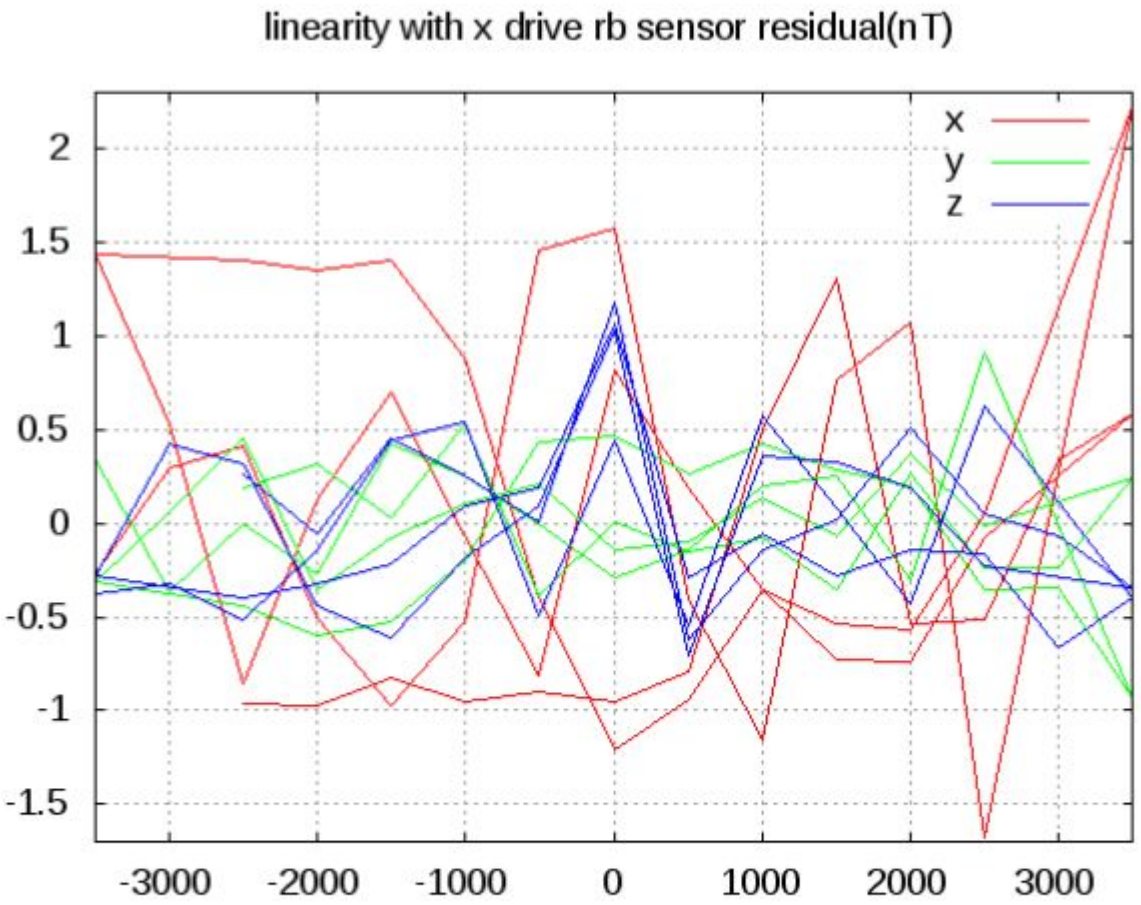


- MAG sensors calibrated at the GSFC Magnetic Calibration facilities
- Sensors maintain good calibration over thermal cycling.
- Gains and orthogonality of axes are measured and good.
- EMFISIS team is working with APL to provide the calibration reports that will be used for on-orbit data products.

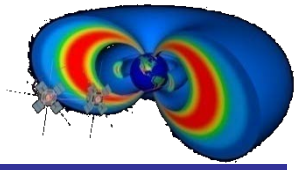
MAG FM1 Linearity



MAG FM2 Linearity

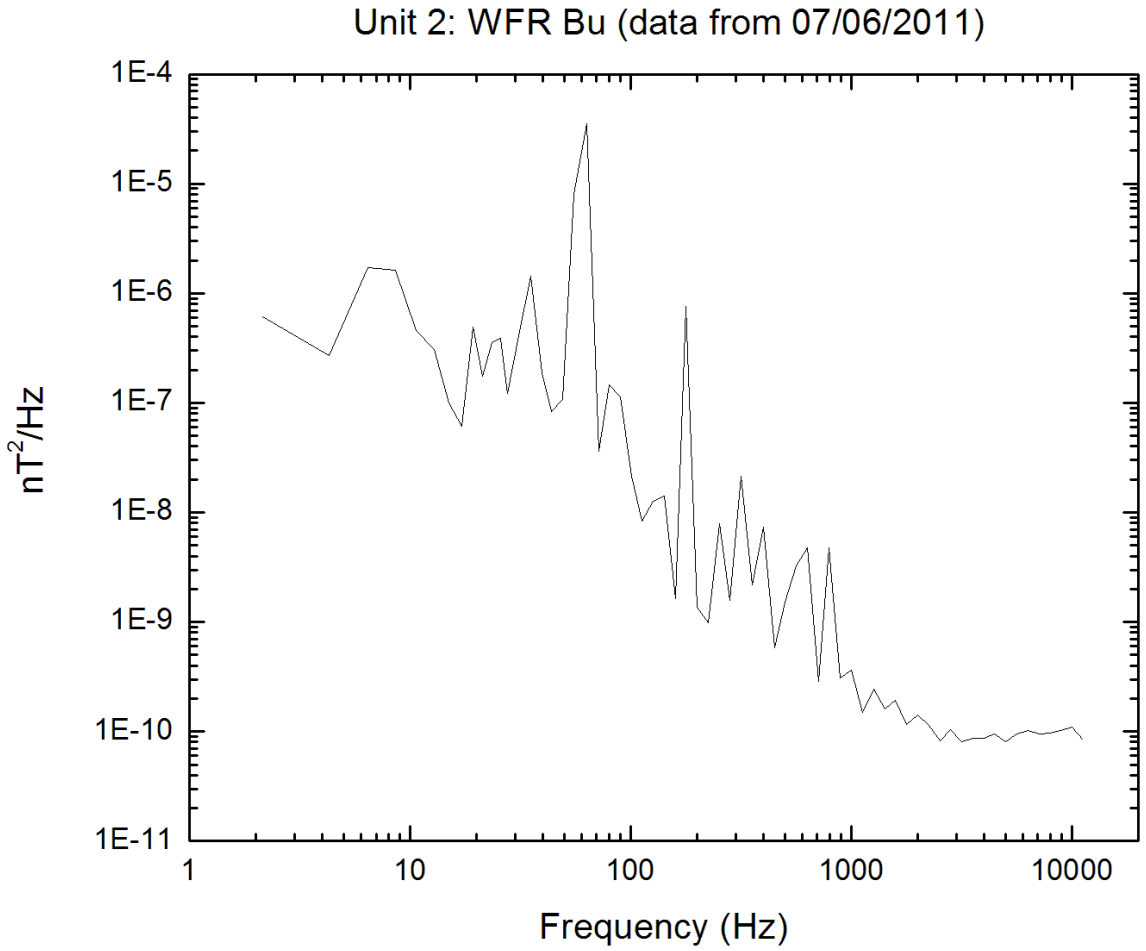


MSC Calibrations

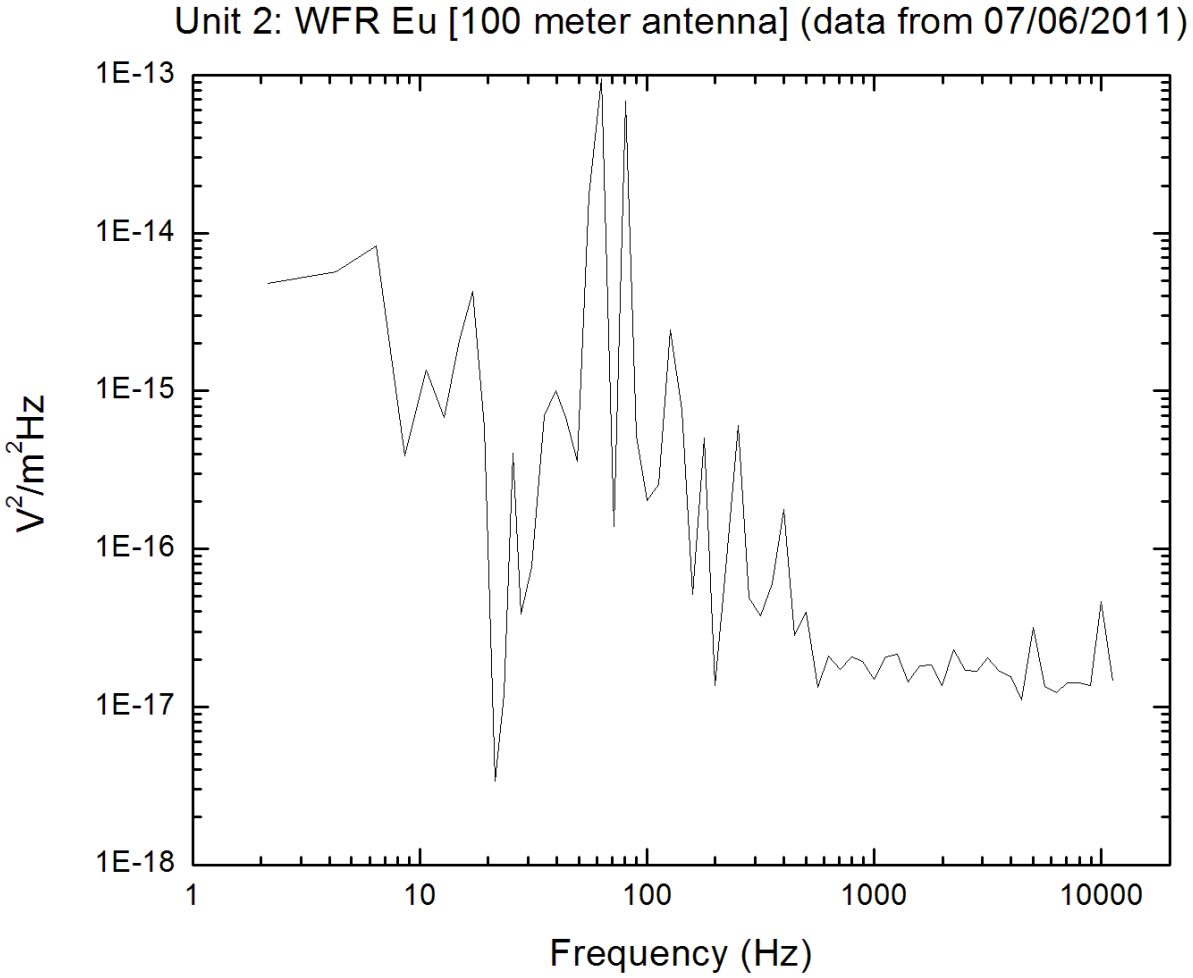


- MAG sensors calibrated AC calibration facility at UI.
- Sensors are calibrated one axis at a time and then entire assembly is checked with stimulus in mu-metal shield cans.
- Sensors maintain good calibration over thermal cycling.
- Frequency response and noise floor are excellent
- Receiver channels are also calibrated independently.
- Electric field receiver channels are cross calibrated with EFW.

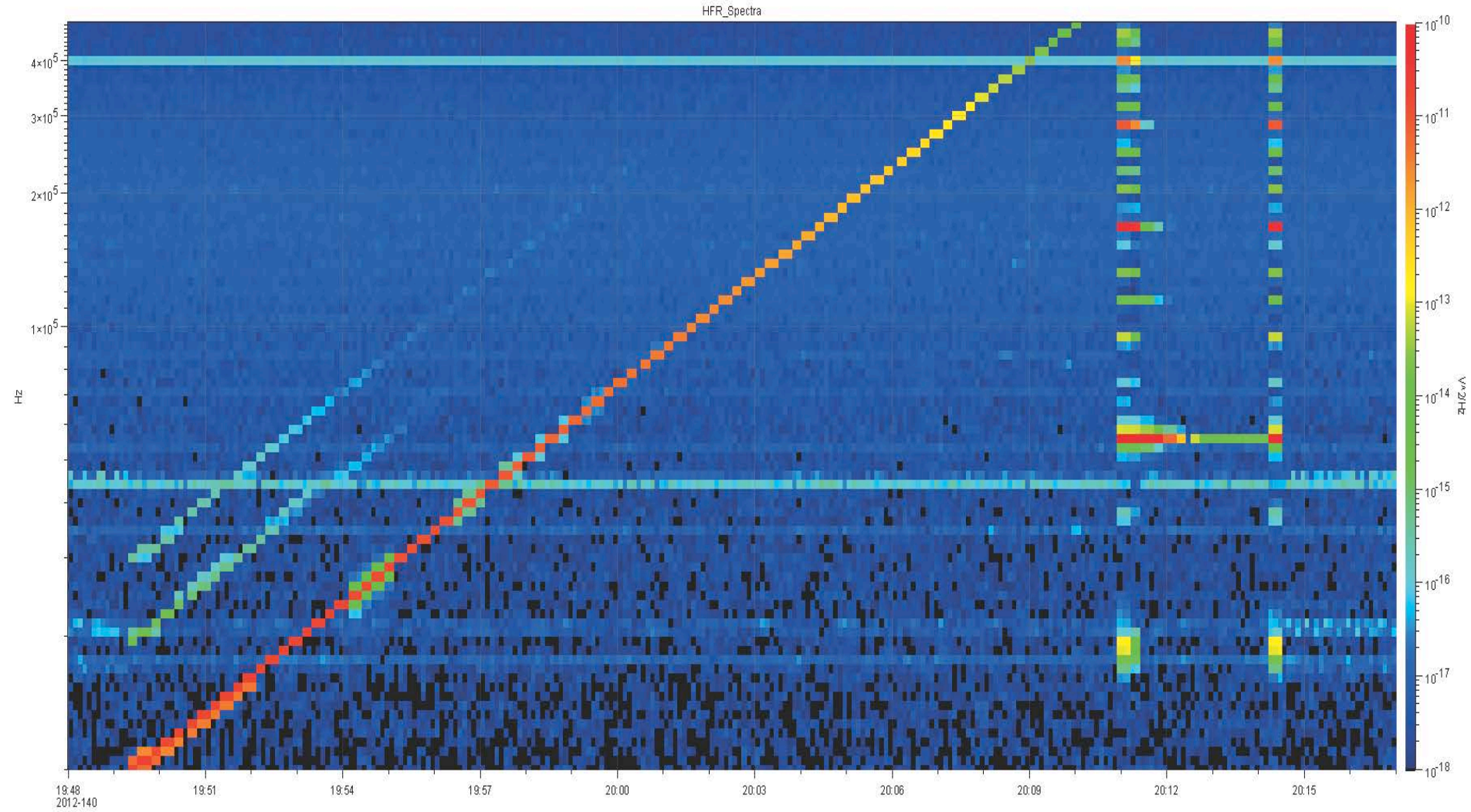
MSC Bu Noise Floor



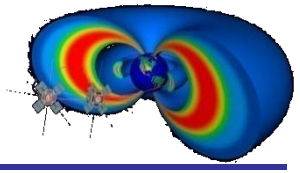
Waves E-receiver Noise Floor



Waves HFR Frequency Sweep



Space Weather Data



- **EMFISIS Space Weather data is generated every 12 s.**
- **Data products consist of:**
  - 1 DC magnetic field vector
  - 6 Waves parameters:
    - Sum of the magnetic field autospectra from $0.1f_{ce}$ to $0.5f_{ce}$
    - Sum of the electric field autospectra from $0.1f_{ce}$ to $0.5f_{ce}$
    - Sum of the magnetic field autospectra from $0.5f_{ce}$ to $0.7f_{ce}$
    - Sum of the electric field autospectra from $0.5f_{ce}$ to $0.7f_{ce}$
    - Sum of the magnetic field autospectra from 10 Hz to f_{ce}
    - Sum of the electric field autospectra from 10 Hz to f_{ce}
  - Waves data products are encoded into 16 bit values