Ideas for handling FAST data, preparing for the mother run 12/23/2014

Adressables:

* **FAST STUFF**
  + What is crucial to renewal?
    - Need to have something better than ‘contributing orbits’ statistic
      * Definitely want plots of electron flux and Poynting flux estimates
    - SHOW THAT THE RESULT IS AT HAND USING ELECTRON FLUX AND POYNTING FLUX DATA
      * review what plots currently get produced for electron and Poynting flux statistics, find out why they’re unreasonable
      * might review how integrals over the orbit are performed--how does one or several bad max flux estimates generally affect the integrated statistic over an orbit?
        + Look at a few specific orbits

Could generate histos like you did way back at the beginning

* + - * !!Could write a code that screens for garbage events, outputs statistics of potential garbage events for a few orbits
        + This would give us a feel of the data in general, might be good to review with Professor LaBelle
    - Might use current Chaston database to tease out what are ‘unreasonable values’ for electron fluxes and currents
      * This might necessitate some familiarity with what numbers to expect for integrals over the orbit, etc.

FOR TOMORROW

* 1. Generate electron flux, Poynting flux histos for all orbits we showed to Chaston at AGU
* 2. Almost inevitably there will be some garbage events--Determine what makes them garbage, write down the numbers, then find out if these values are orders of magnitude above what is ever expected in the cusp or observed in general
  + (I should know order-of-magnitude values for flux, integrated and otherwise)
    - Such knowledge now exists; see “alfven\_db\_cleaner.pro” in ACE\_FAST directory
* 3. Have plots of these ready to see if it’s an instrument error or something else--what causes them to be “bad”?
* 4. Write your little screening routine to filter through, produce statistics, and (ideally) produce plots of the relevant quantities
  + Would be bonus if we could slap this into Alfvèn stats 5 to make the plot generation/screening happen on the fly and get outputted in some sort of summary file.
* 5. Perhaps test out the screening on a few other orbits--how does your new code compare to your going at it ‘by hand’?
  + a. If efficient, perhaps skim the whole Chaston DB to see if it improves plots/makes electron and Poynting flux plots feasible
  + b. If not, go back and revise. It’s possible I’ll need to be flexible with the numbers.
    - Might even want three indices to indicate quality:
      * 0: good
      * 1: warning! (within an order of magnitude or two of unacceptable value)
      * 2: Garbage--way below or way above acceptable value
  + Find bad points, discover a way to discard/flag (example, Chaston event 130 in orbit 10000)
  + Need to save t\_start and t\_end time in order to (possibly) expedite running over the database in the future
    - DONE for all Alfven events
    - NOT done for interval start and stop times
  + Perhaps introduce an outputted logfile and an index to flag spurious events based on
    - Absurdly high fluxes
    - Absurdly high currents
    - Absurdly high Poynting flux estimates
    - Spikes in current, magnetic field
      * Could have a picture outputted as well
      * Might not be a bad idea to generate sumplots for all orbits as well, if we’re going to be running anyway…
  + Need to figure out which computer we’re going to use--talk to Terry
  + Ion data
    - Good for two years after launch (which was Aug 21, 1996)
    - This takes us up through orbit 7907 (Aug 21, 1998, 2300 UT or so)
* **CAPER**
  + Pull gains off all non-AGC channels (ELF, VF, SKIN, right?) **(DONE)**
  + Write CAPER data types--document the structures of, say, TM1, TM2&3, TM4, DUAL{A,B}, digitizer, etc. **(DONE)**
    - Could be the group classic on data types/files/formats…
      * **DONE in Dec 2014**