Statistical Noise Baseline in AC6 Data

Mykhaylo Shumko

2019-02-04

This report describes the procedure taken to calculate the statistical noise baseline in the AC6 data. The motivation for this analysis is to estimate how often (or fraction of the time) that a cross-correlation (CC) above a certain threshold is due to random chance is not physically connected.

The general approach here is to first bin AC6-A (since it has more 10 Hz data) dos1 counts when it was in a similar magnetospheric location and condition. The binning was implemented by saving the counts from each bin into its own file in the data/binned\_counts/ folder. An example filename is “AC6\_counts\_4\_L\_5\_9\_MLT\_10\_300\_AE\_400.csv”.

Then for each bin I CCd data in three different regimes with varying realism, random-random, microburst-random, and microburst-microburst CCs.

For the “similar” location and conditions, I defined bins in L, MLT, and AE. Currently, the bins are:

* L = {4, 5, 6, 7, 8},
* MLT = {0, 1, 2, 3,… 14}
* AE = {100, 200, 300, 400, 500}

The first step