Wavelet-based microburst detector code validation

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2018-08-15

**Detector parameters**

Here, we explore the brute force validation of the wavelet-based microburst detector code. The microburst detector code had the following properties: wavelet=”DOG”, cadence=0.1 [s], with other parameters set to default. They are: j1 = 80, zero padding = True, dj = 0.125, s0 = 2\*cadence (0.2 [s]), siglevel=0.98, lag1autocorr calculated from the data. Period filtering was done between s0 (0.2 [s]) and 1 [s] periods. The filtered data threshold for detection was set to 0.1 c/s.

**Data parameters**

10 Hz data from AC6-A was used in this validation. The data from 2016-10-14 was used. This day had many microbursts, with some instrument noise, and a few periods of saturation. Suggestion for future validation studies is to use another day such as 2015-04-14 where there is much more instrument noise.

**Methodology**

Go through the entire day by hand, and characterize the number of microbursts detected (true-positives), number of microbursts not detected (true-negatives) and number of times random data was wrongly flagged as a microburst (false-positives). While I populated these categories, I paid attention to the data which differentiates one category over another.

**Results**

From the entire day, a total of 458 events were flagged. Out of these events, 397 of them were true-positives, and 61 were false-positives. So with these flagged detections, 13% of them were false positive. Furthermore, 134 microbursts were missed. This corresponds to an detector efficiency of 75%.

Overall, I am satisfied with the false-positive rate and detector efficiency.