Typical magnetic field stability in the Meson Hall

New source meeting

10/09/2019

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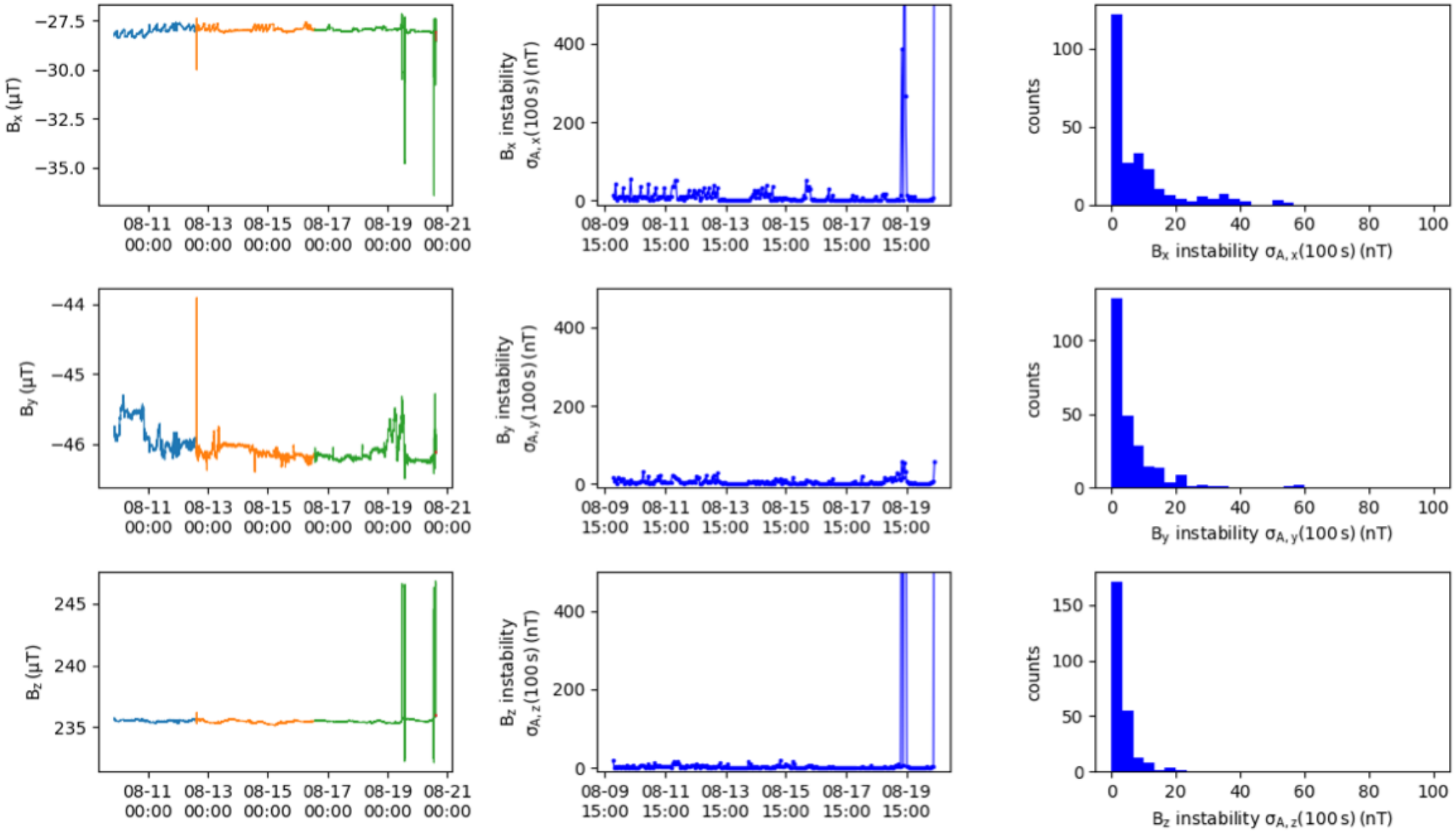
Contents

- Evaluation of magnetic field stability by the probe used for mapping, read out by three commercial DMMs
- Why not use the five-sensor monitoring system?
  - Some of them have noise with amplitudes on the order of 10 nT
- The probe monitored at a fixed probe position (u,v,w)≃(20cm,110cm,200cm)
  (On the SCM plate, I will write down a more precise number later)
- Duration: from the 9th of August to around the 5th of September
  Data in this report contains only until the 21st of August. Will be extended as soon as I recuperate the data

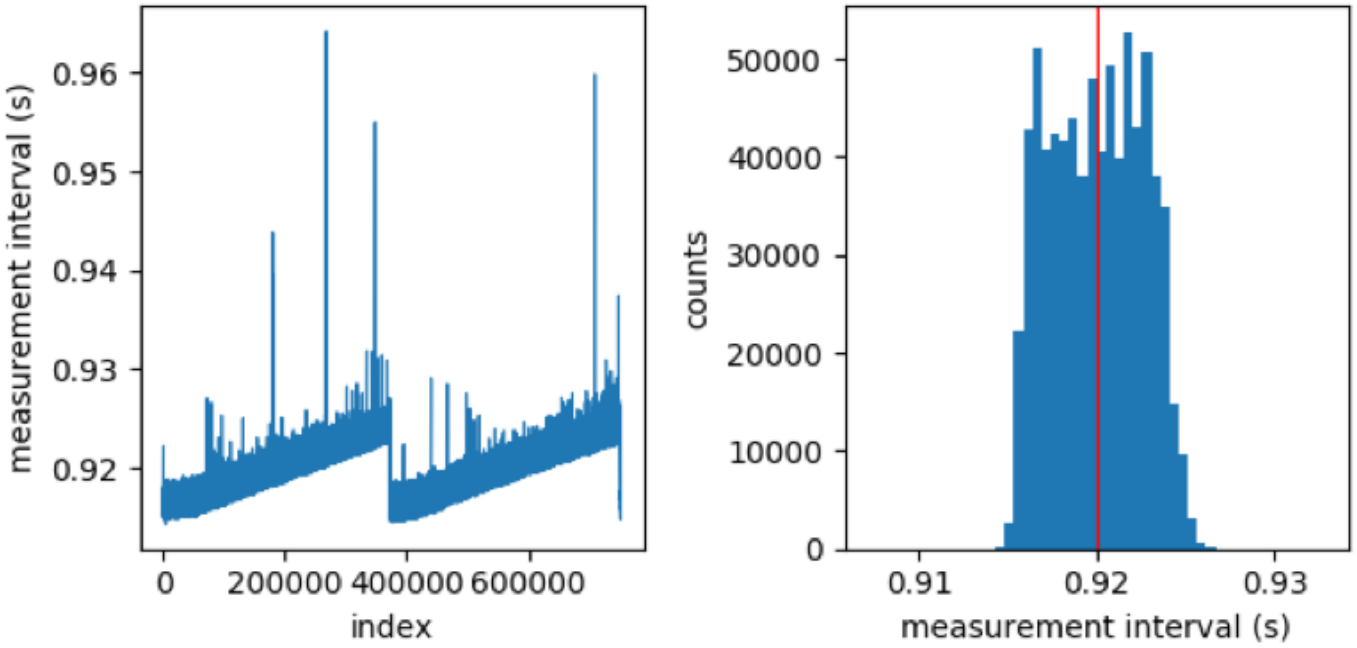
Data evaluation method:

cut data with 1-hour time windows, and evaluate 100s Allan deviation in each window



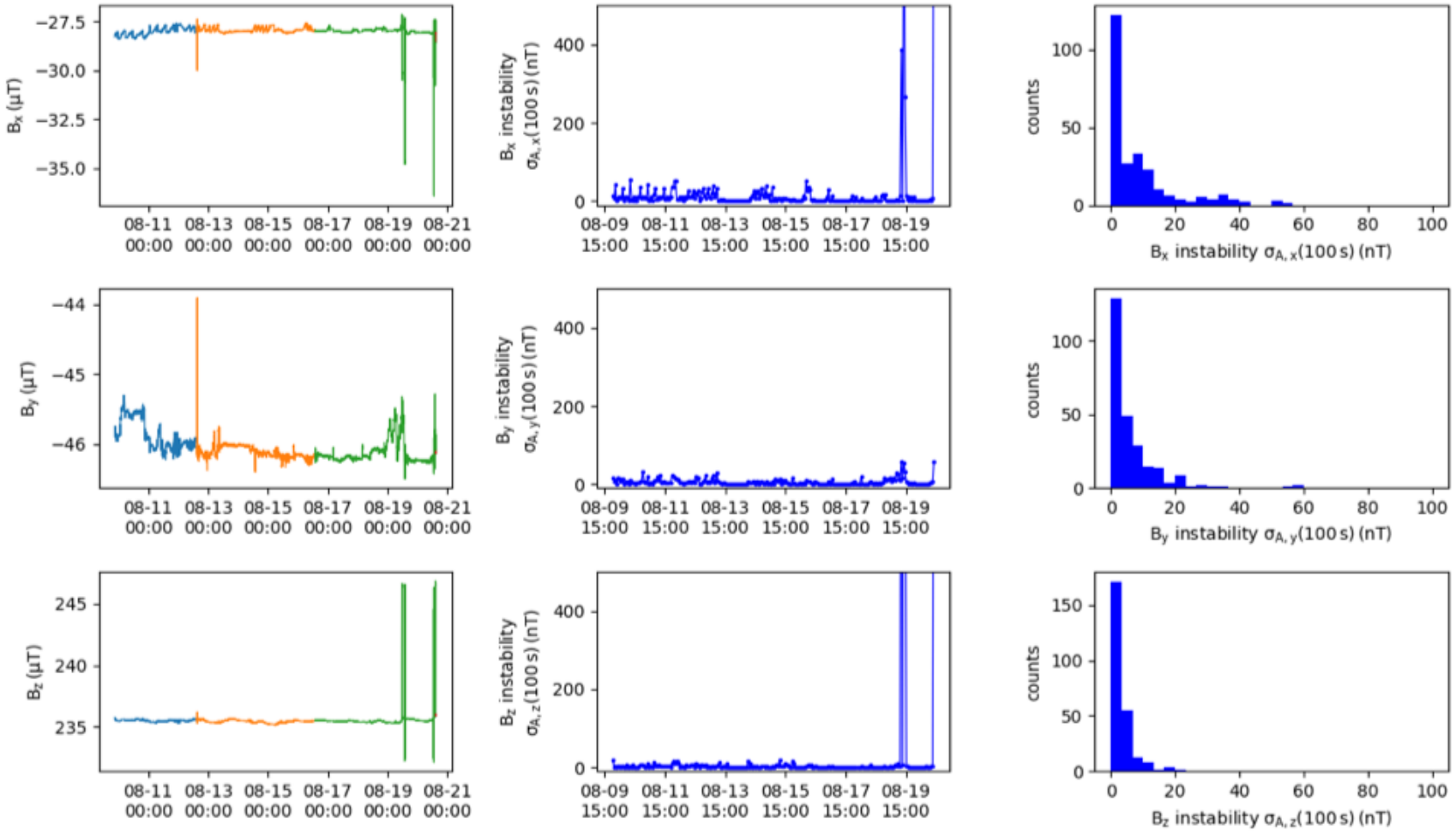
- The jumps are by the crane
- Typical 100s stability

Check sampling interval



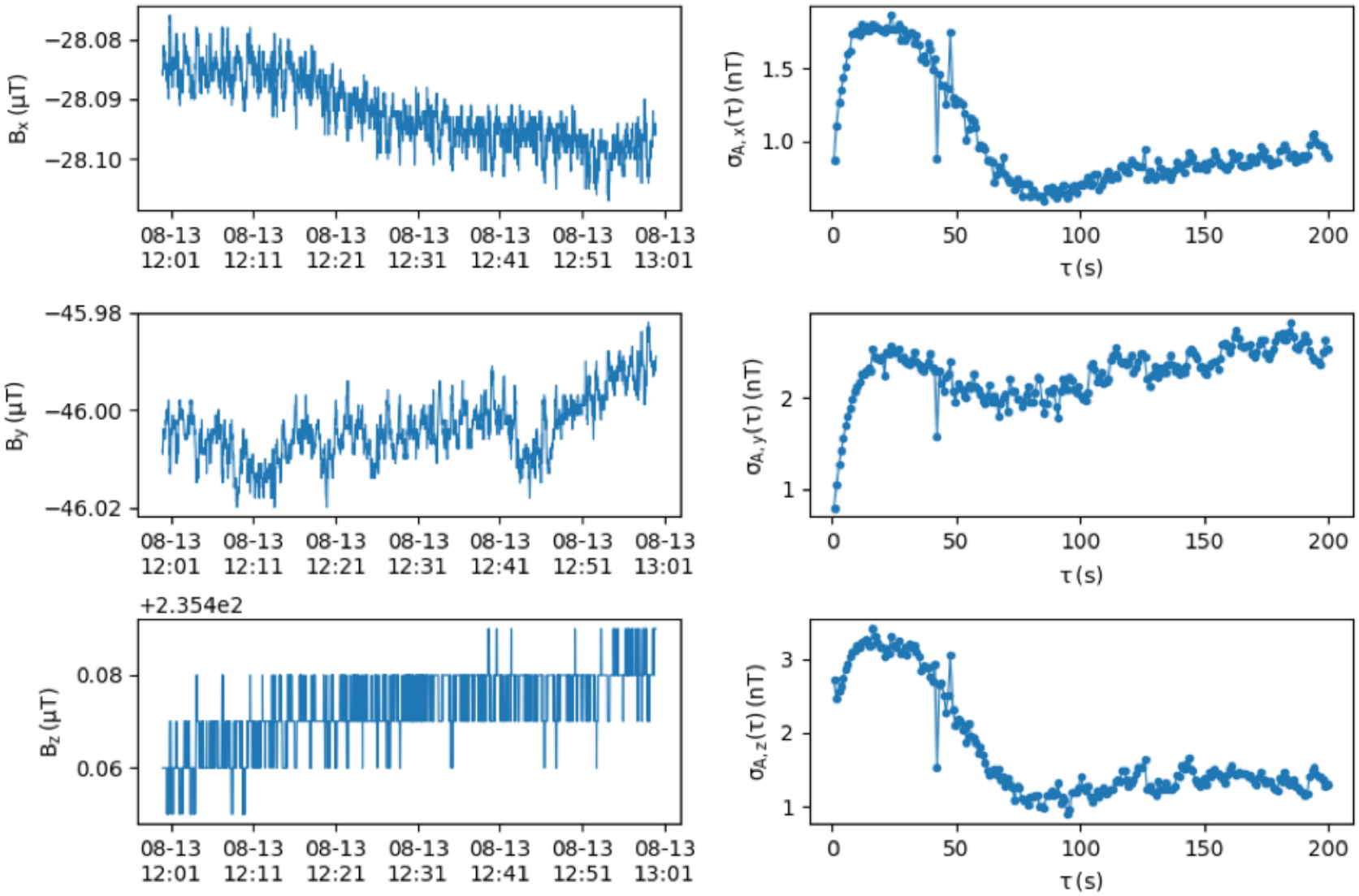
- For some reason the sampling interval drifted
- Cut with 5*σ -> average : 0.91998 s
- N_A= 100 (τ= 100.242) was used to evaluate 100s stability

Transient of 100s magnetic field ADEV

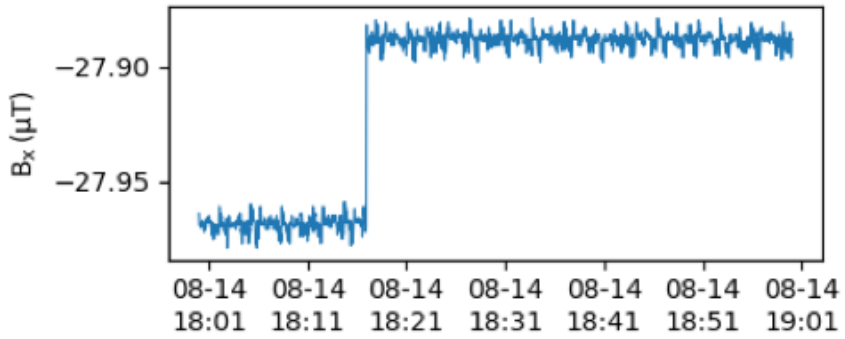


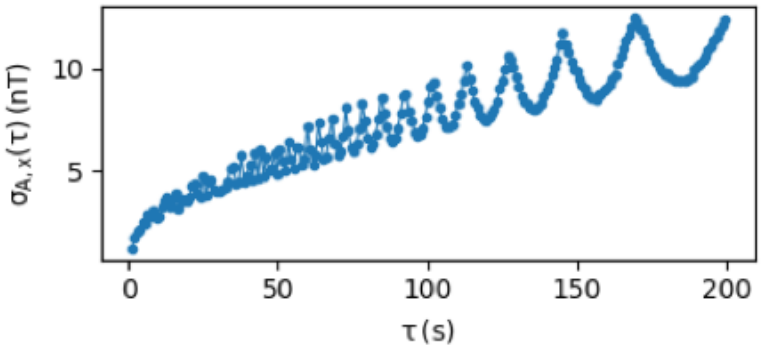
- Horizontal components are more unstable <- from experiments and beamline components
- Typically < 60 nT for horizontal, < 30 nT for vertical → |B| fluctuation < 90 nT

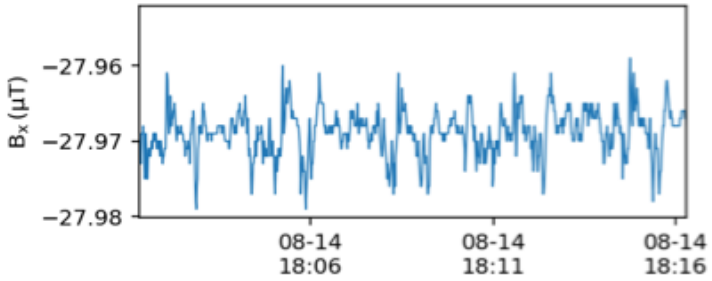
Aug. 13 12:00–13:00 (stable)

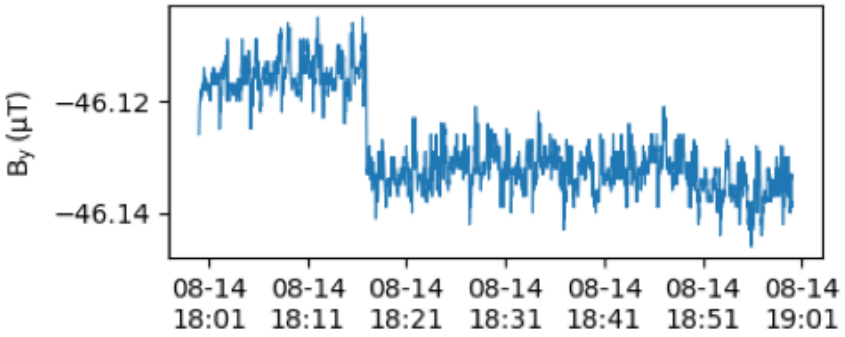


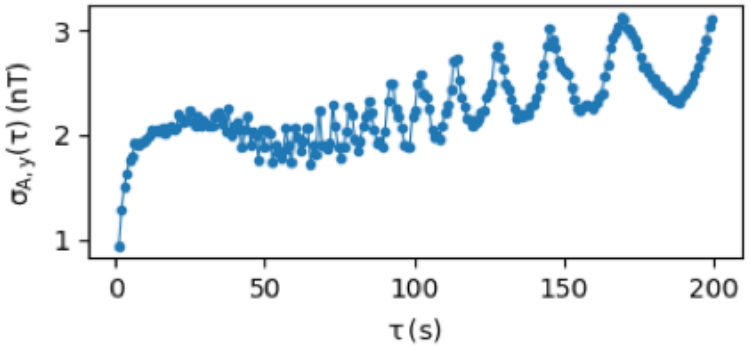
Aug. 14 18:00–191:00 (oscillations)

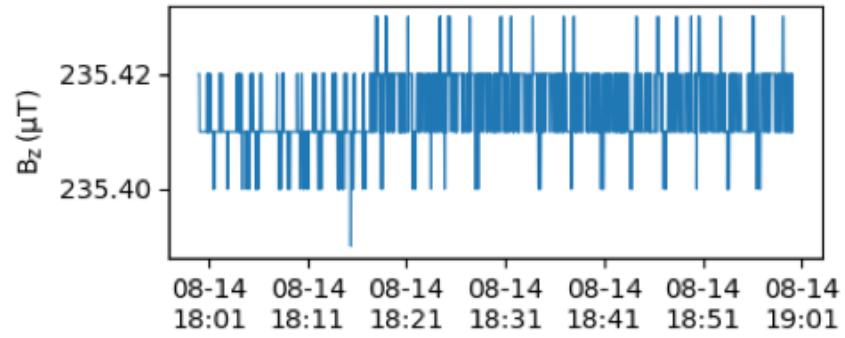


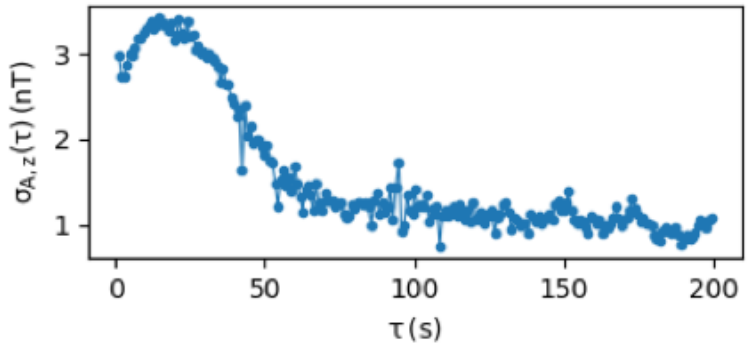












Aug. 14 20:00-21:00 (M20 steps+oscillations)