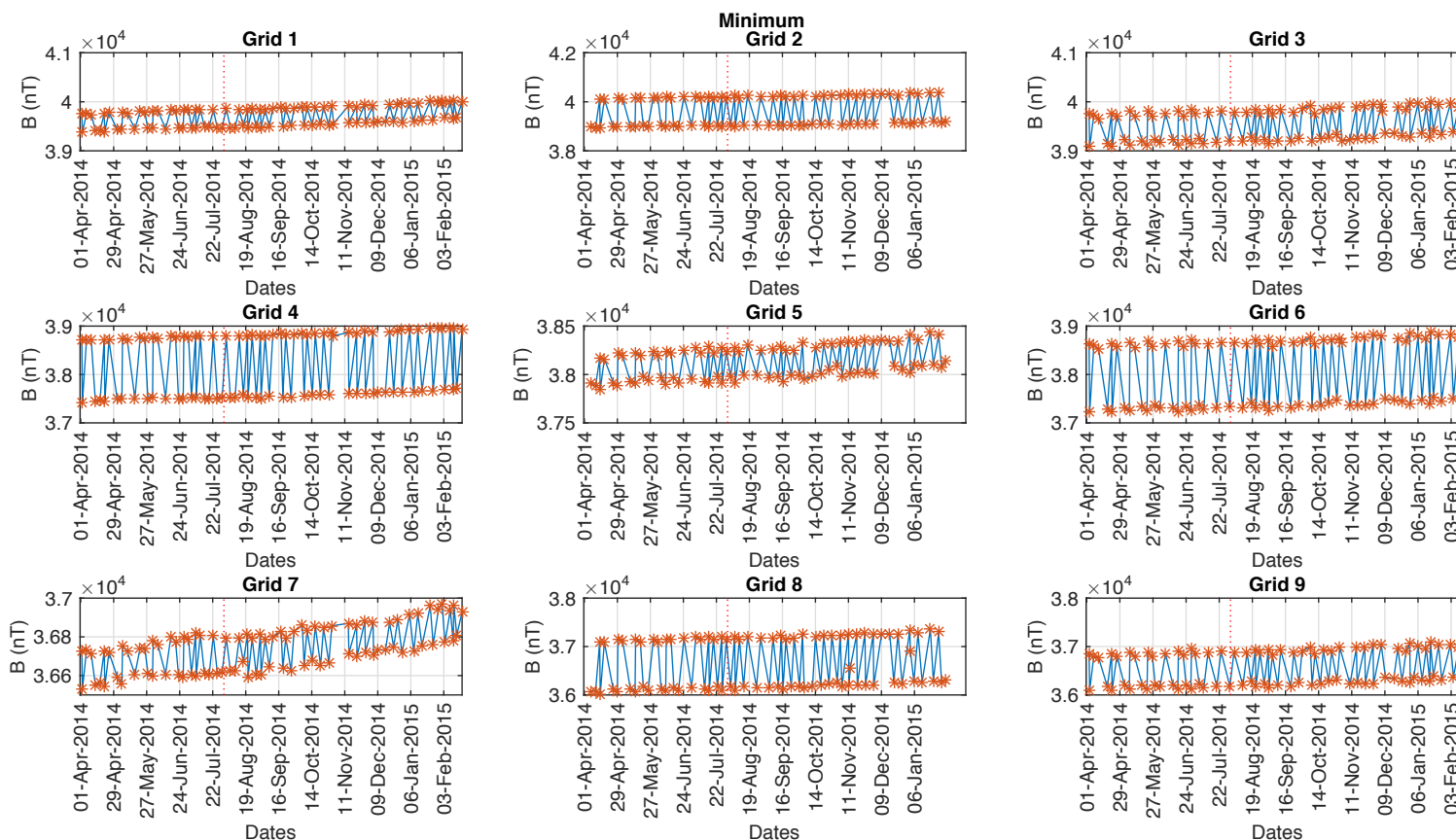




Minimum visualization of SWARM A VFM Data



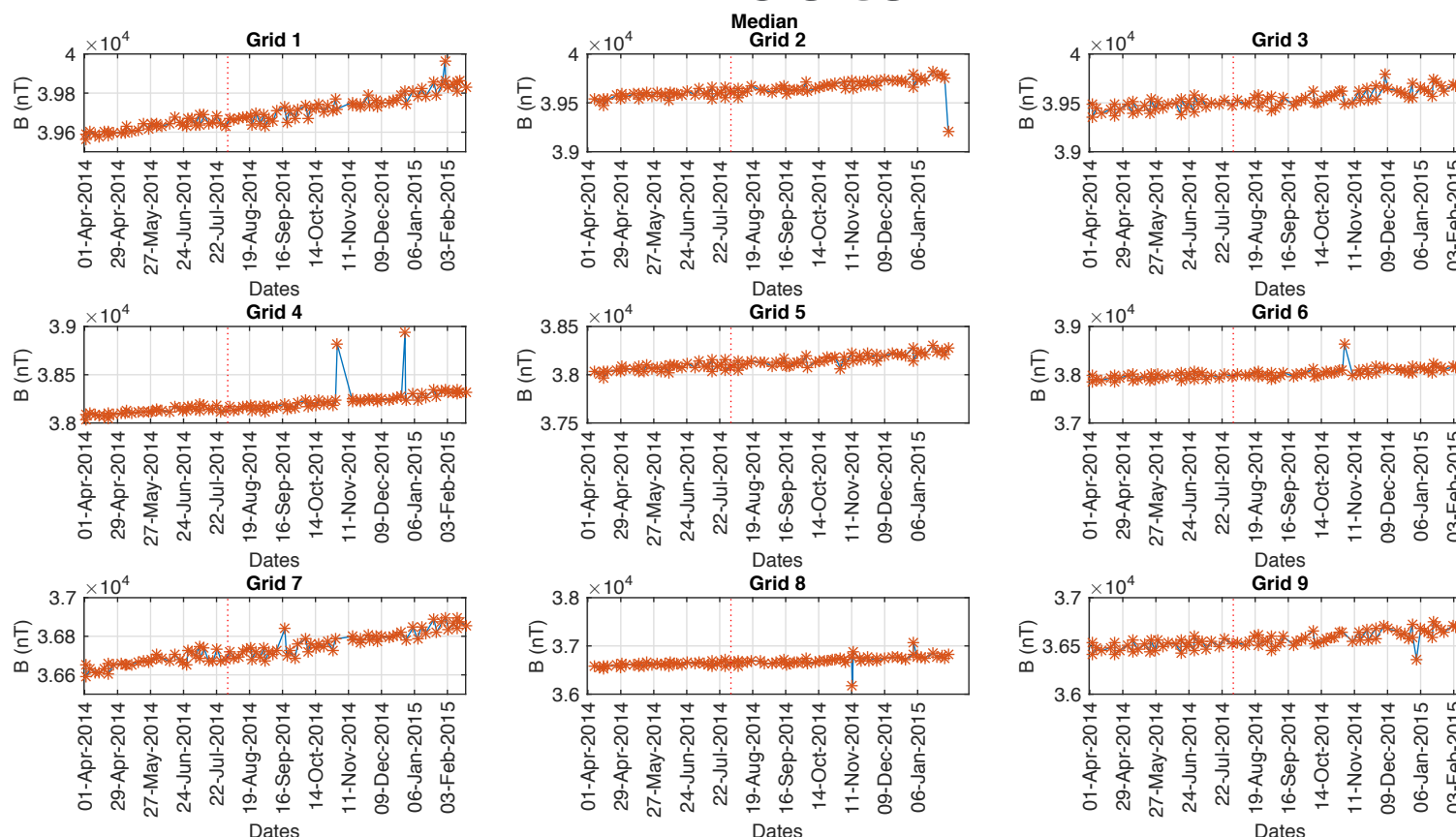
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Median visualization of SWARM A VFM data



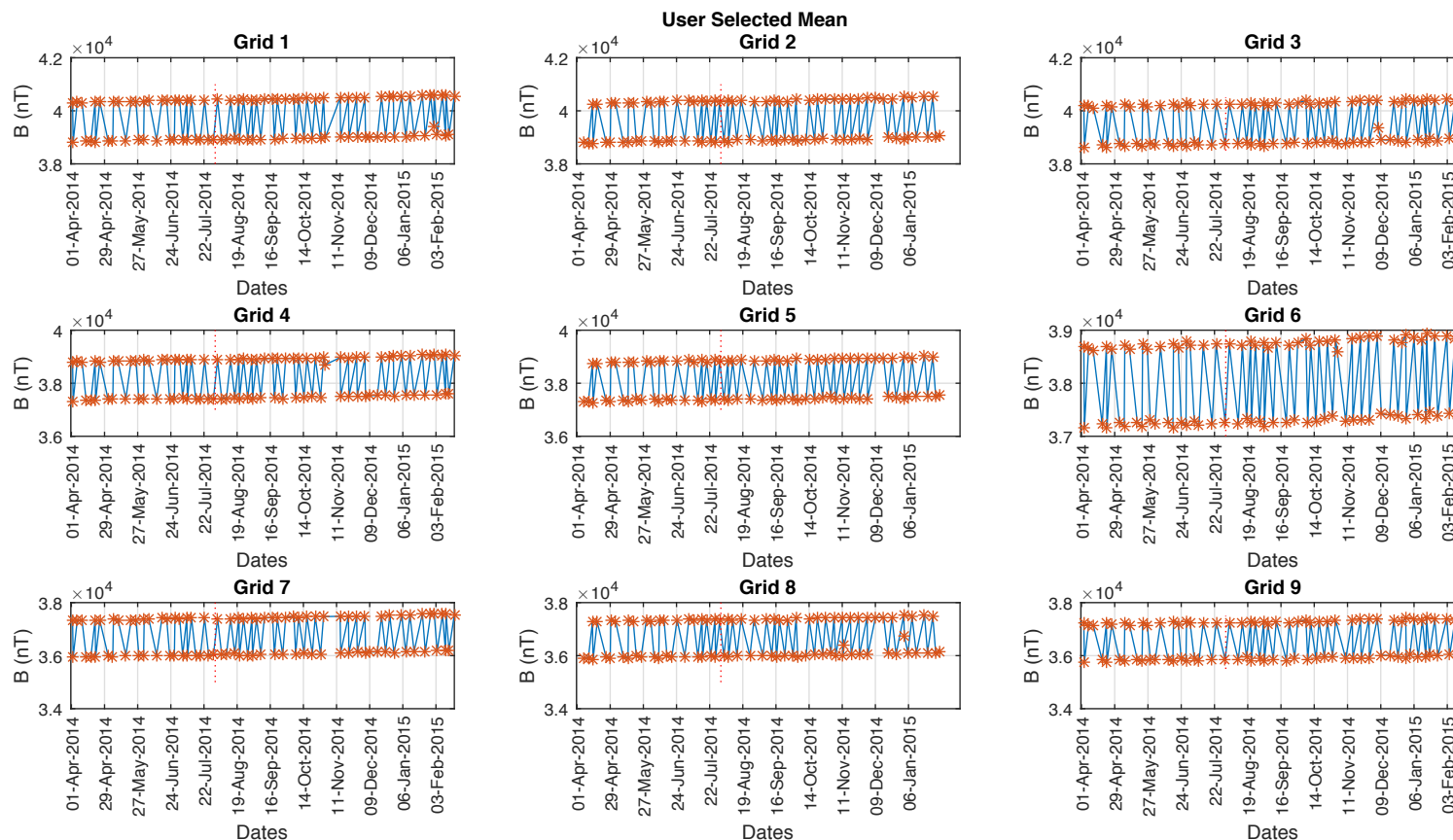
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Mean visualization of SWARM A VFM data



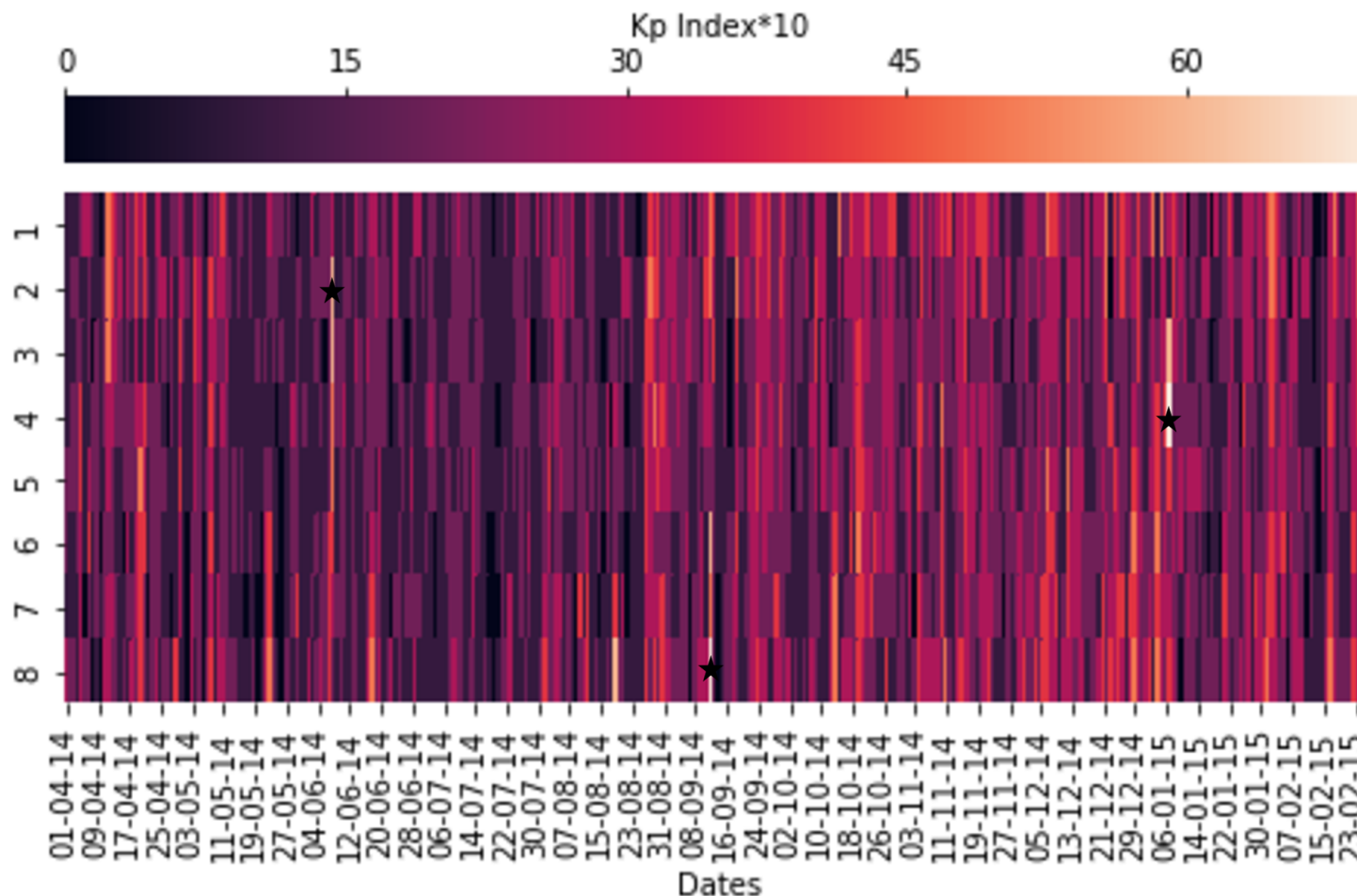
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Planetary Kp-index



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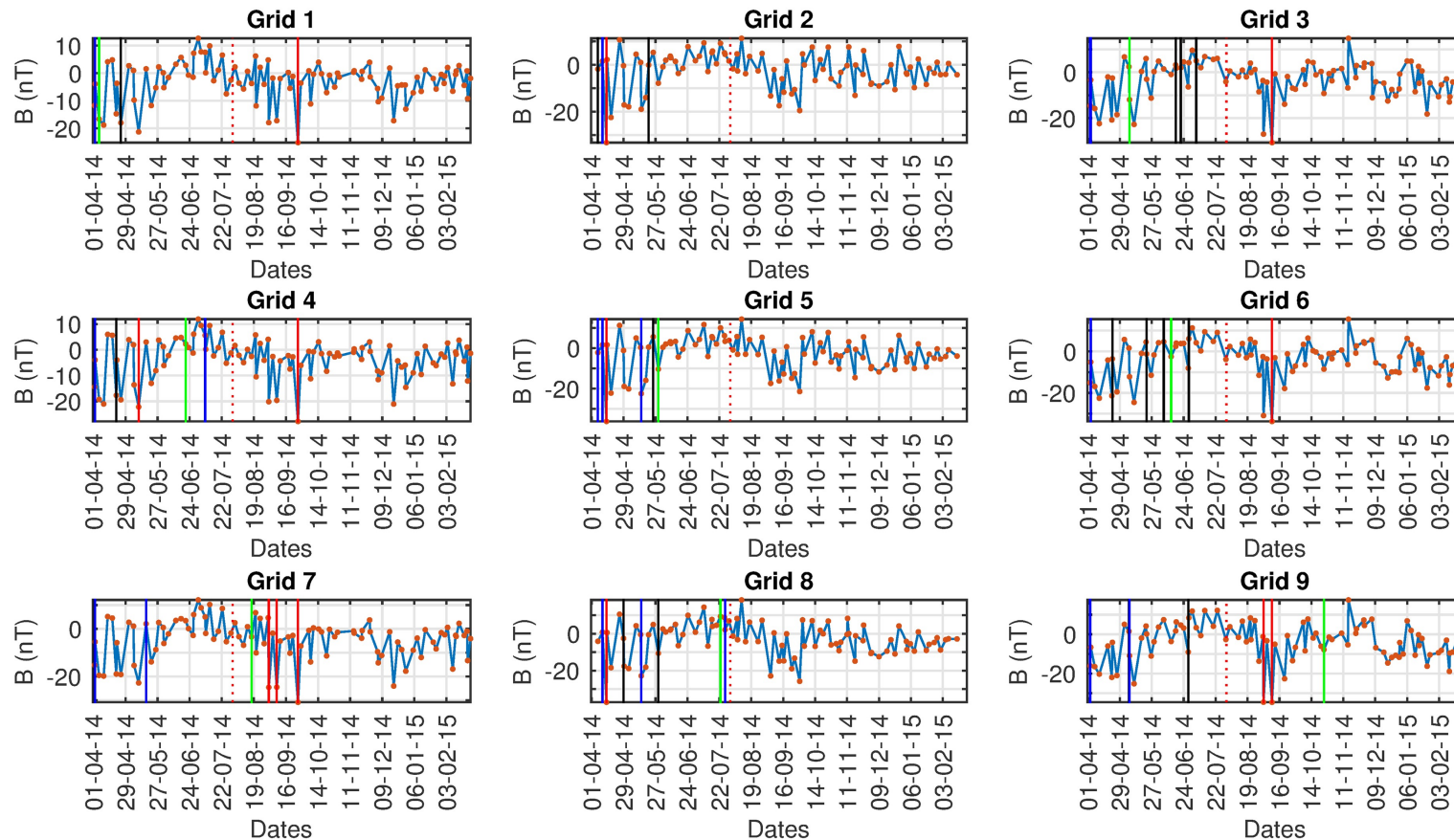
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Red: CE; black: Fuzzy; blue: D-SAX; green: SAX for Swarm A



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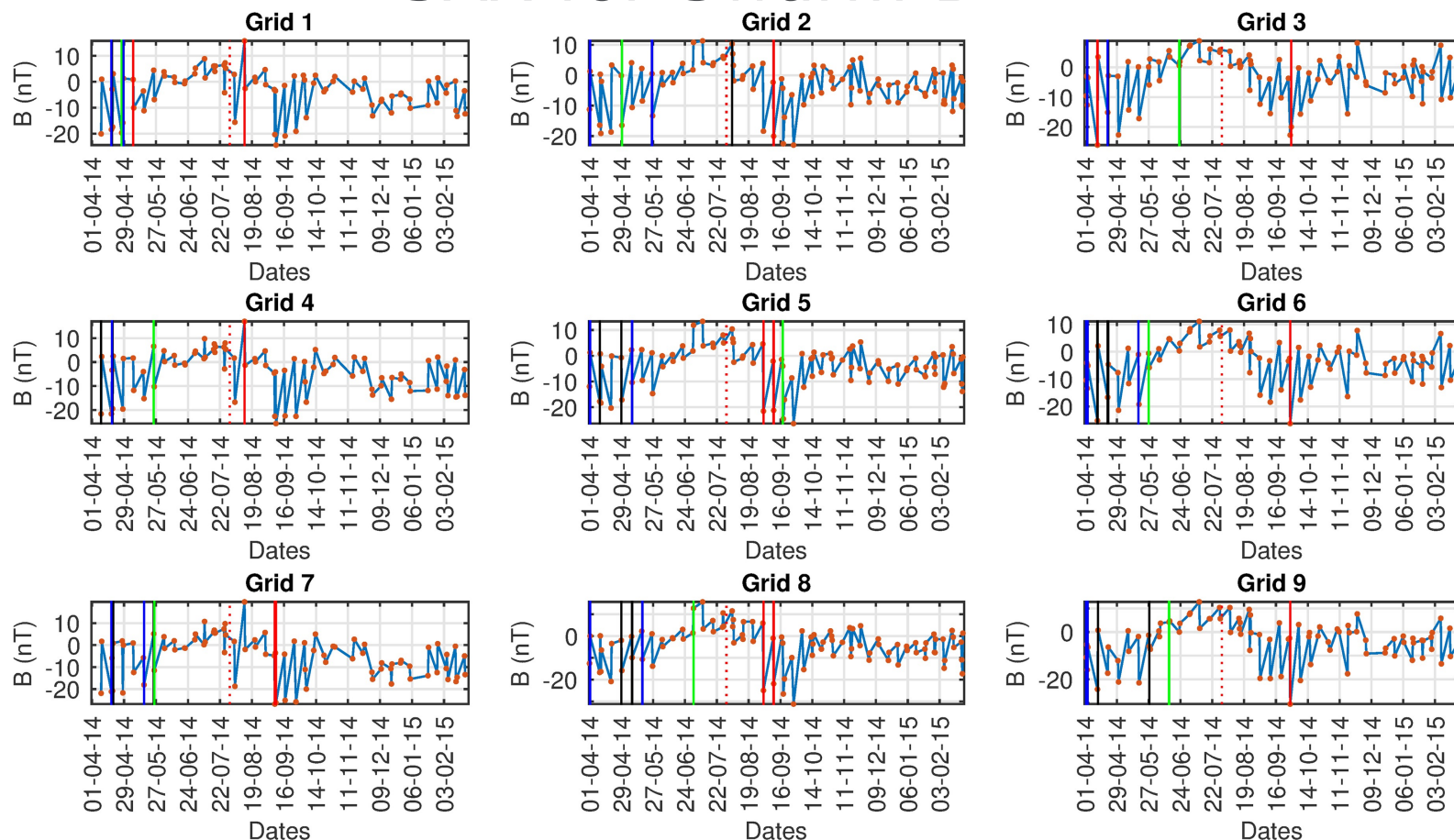
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Red: CE; black: Fuzzy; blue: D-SAX; green: SAX for Swarm B



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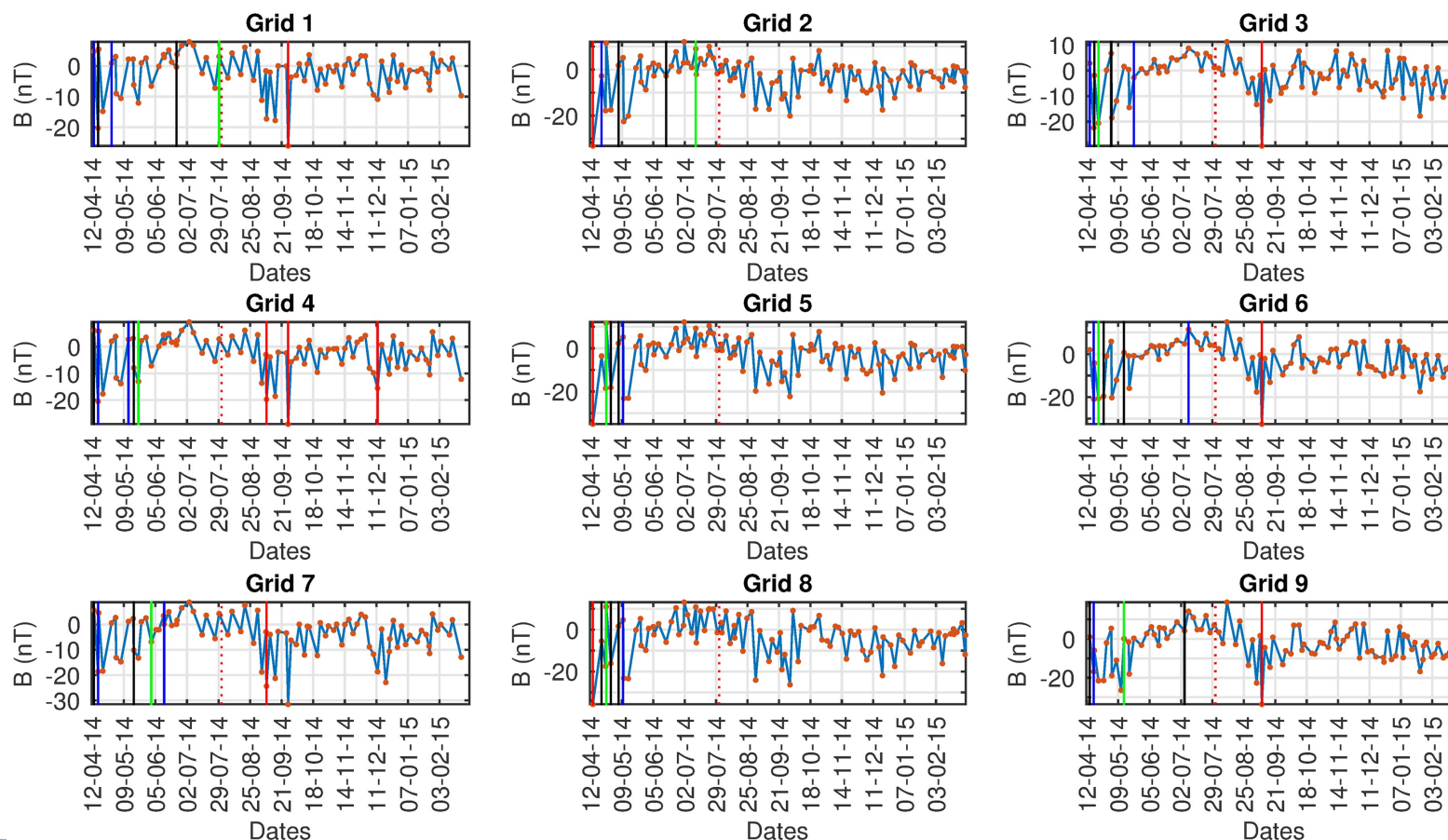
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Red: CE; black: Fuzzy; blue: D-SAX;
green: SAX for Swarm C

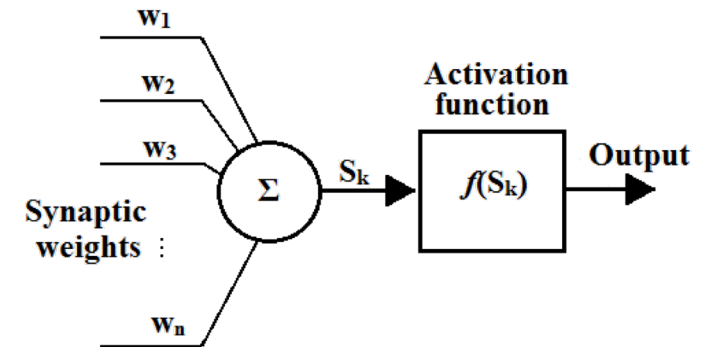
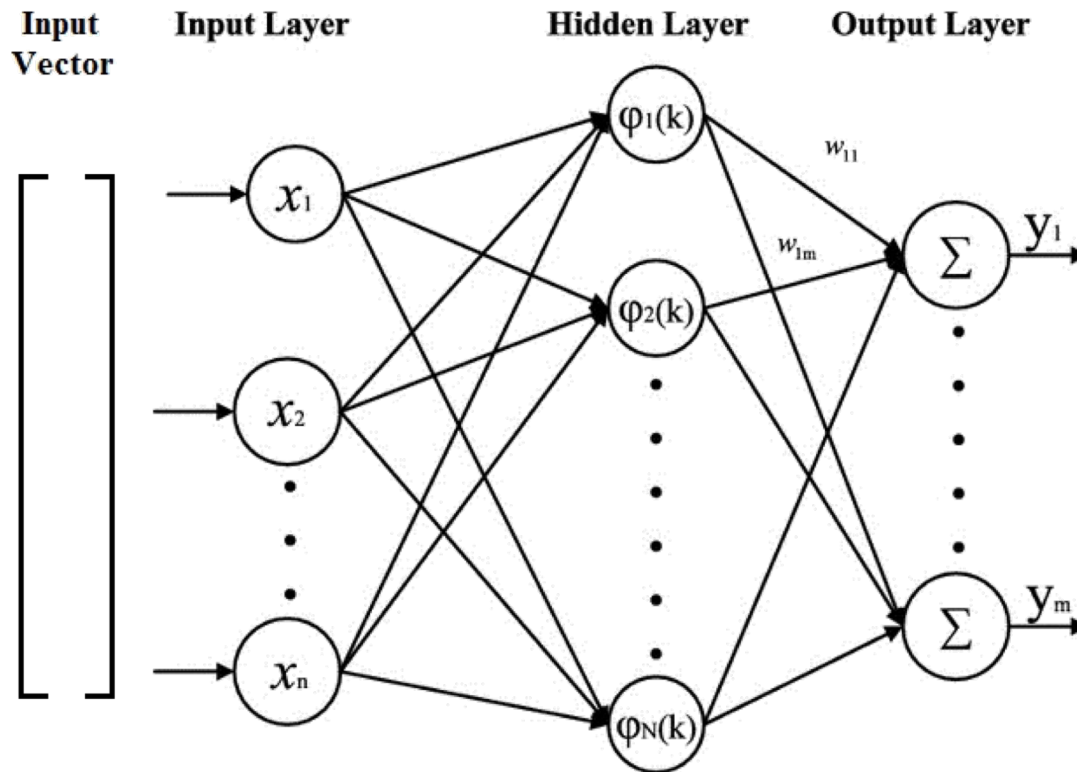


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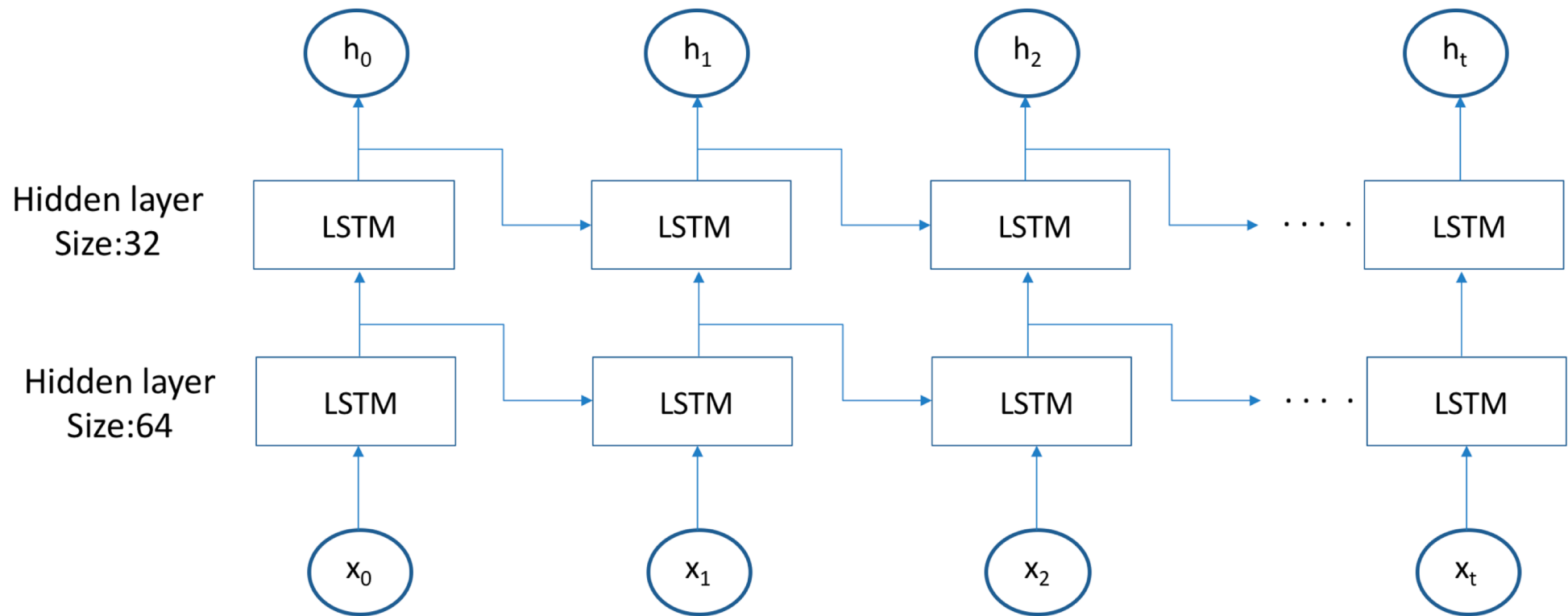
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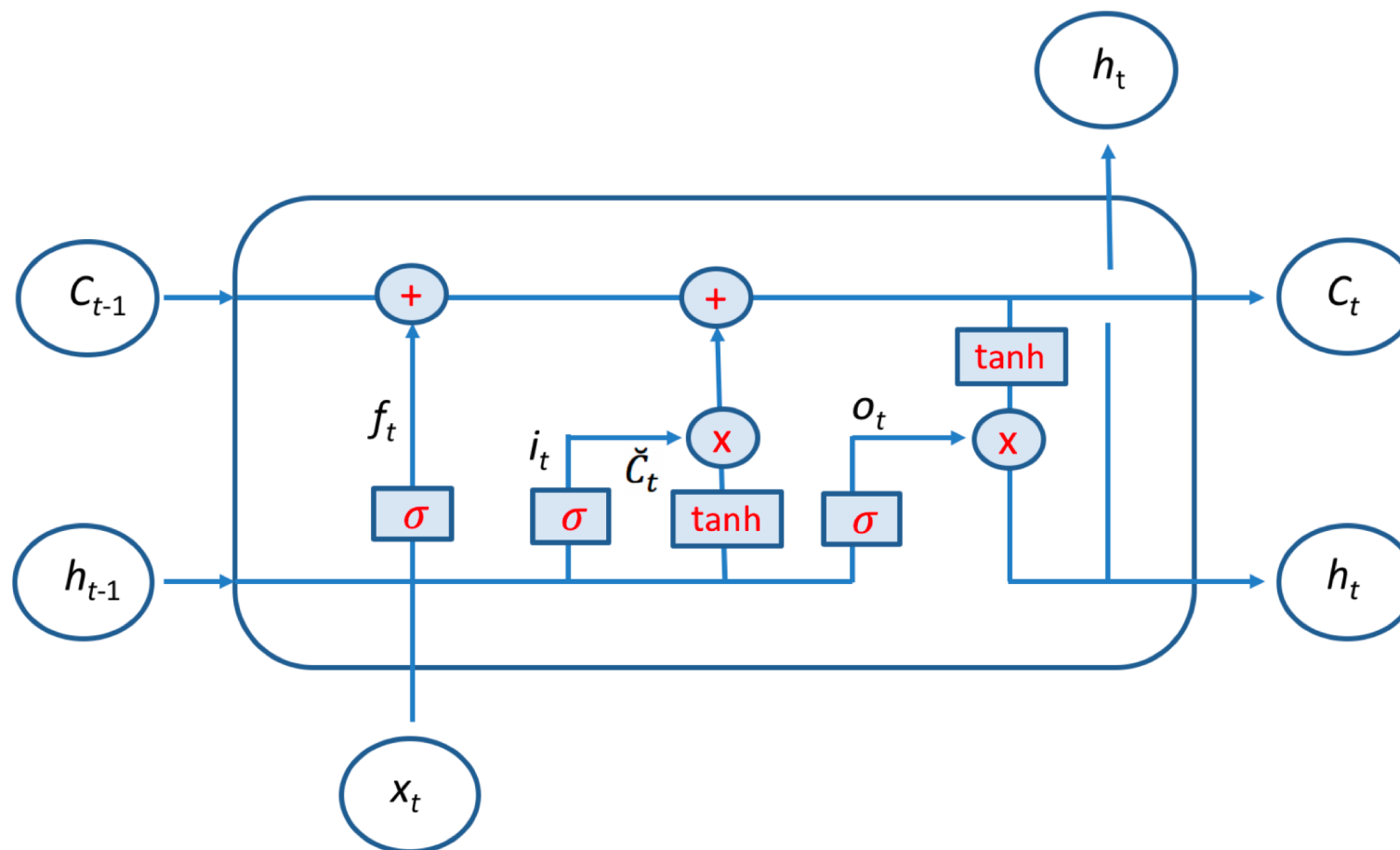


Sum of input and weights is propagated to the "neurons" in the hidden layer where an activation function f is then executed below

$$f(x_i, c) = \exp[-\beta \|x_i - c\|^2]$$

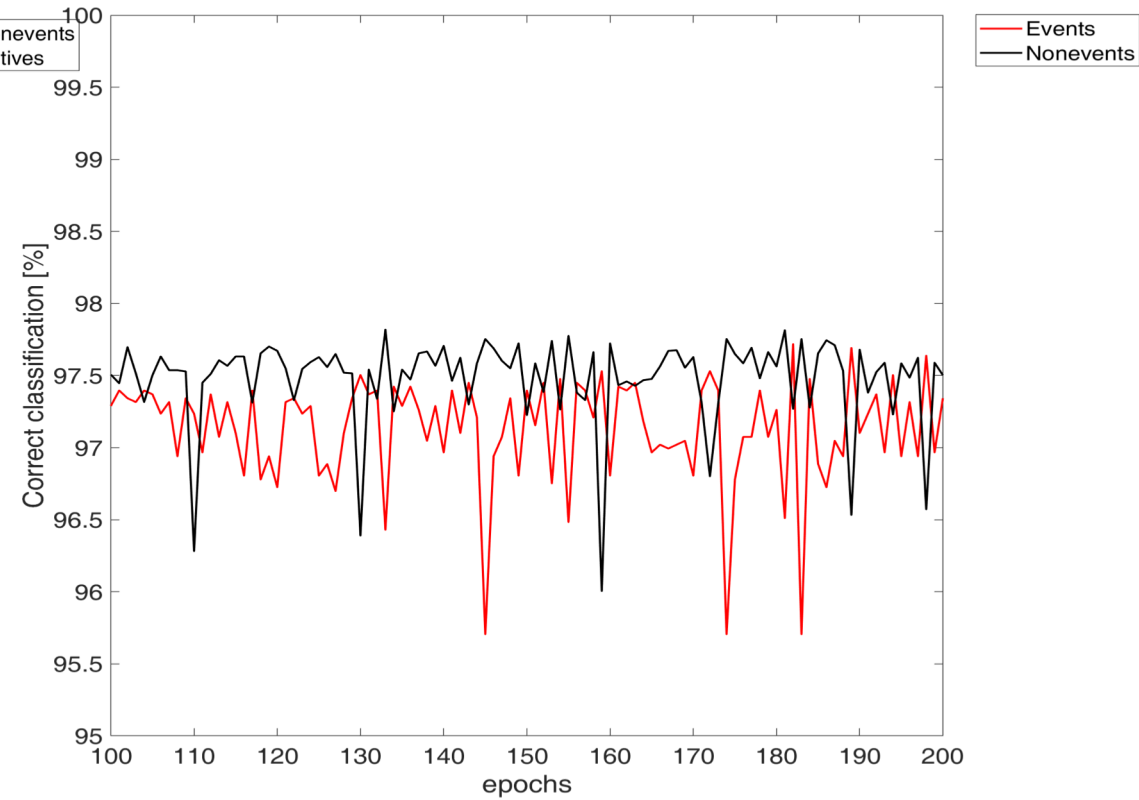
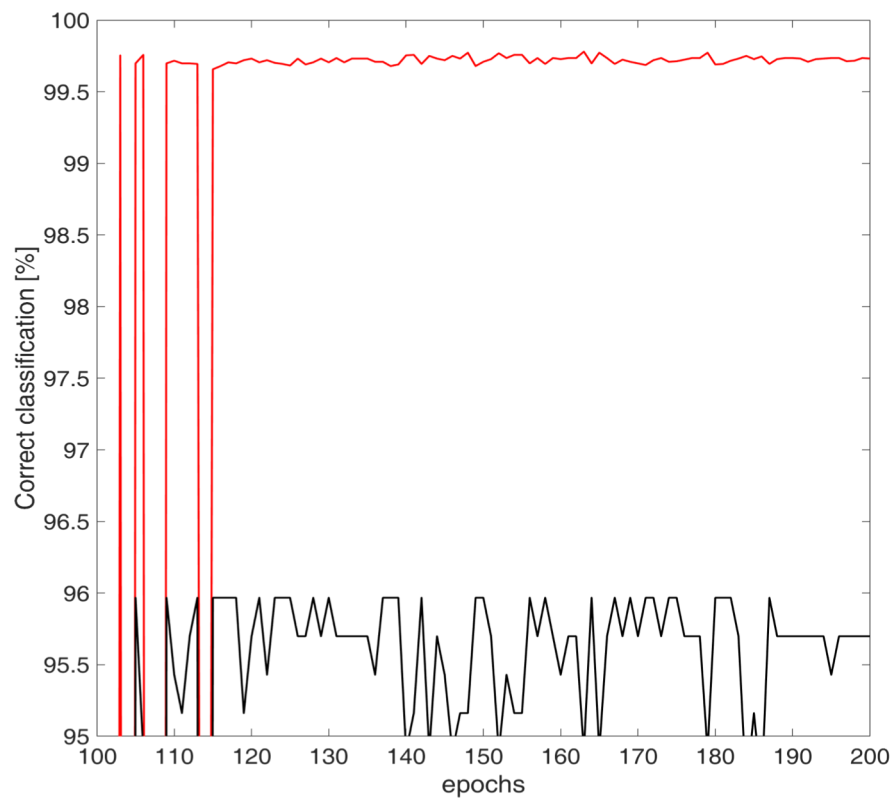
Deep learning: Long Short Term Memory (LSTM)







Difference between training and testing



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- Considerable amount of electromagnetic variations observed by satellites might be due to external perturbations, rather than linking with the effects of potential earthquakes
- The geomagnetic indices: K_p , a_p , etc. should be considered to distinguish whether detected anomalies are associated with the seismo-ionospheric anomalies rather than solar activities
- What impact of International Geomagnetic Reference Field (IGRF) is in seismic anomaly detection, differences calculated between the measured magnetic field value and the predicted one from the IGRF model will be used
- Quality of geomagnetic time series data generated would be extremely important factor for determining seismic anomalies



Summary (cont'd)



- The creation of an accurate model (deep learning) of anomaly detection for Swarm satellite data could be transferred for analyzing CSES data
- Comparative studies across three data sources is on the way

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Thanks for your attention

Questions?

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