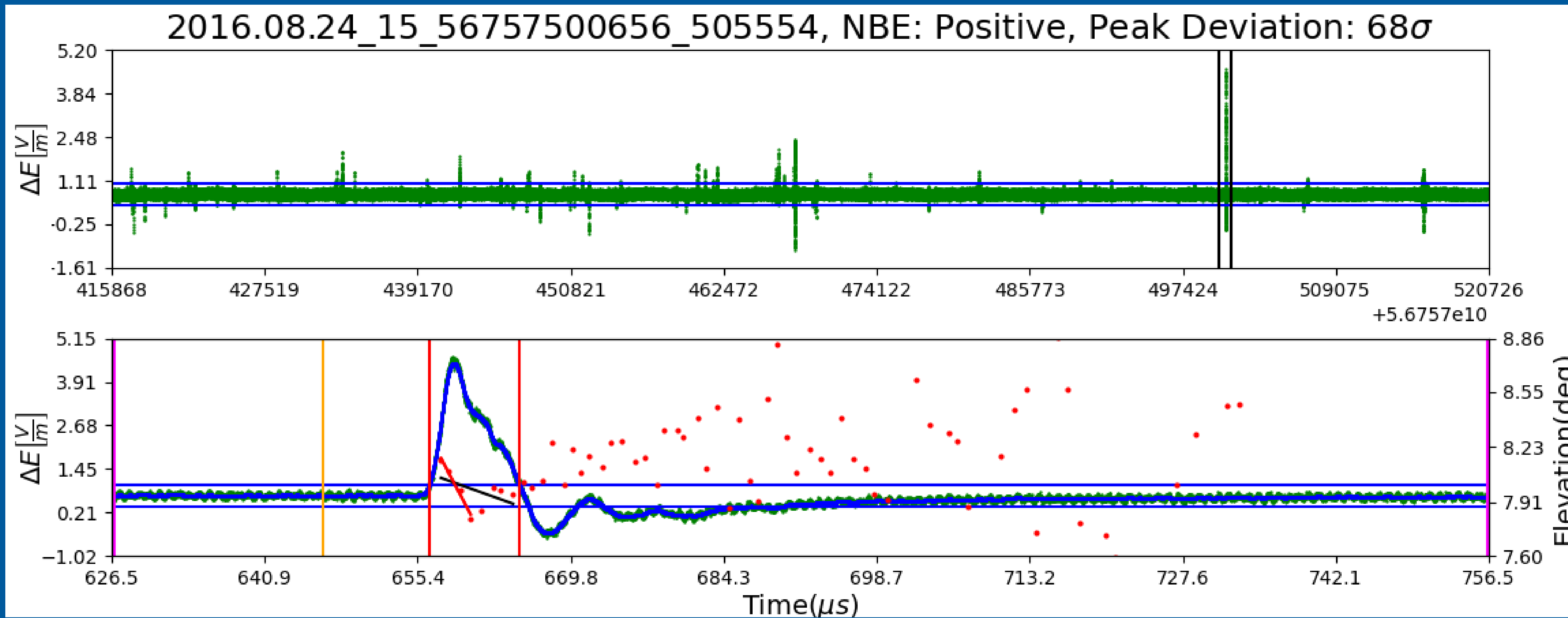


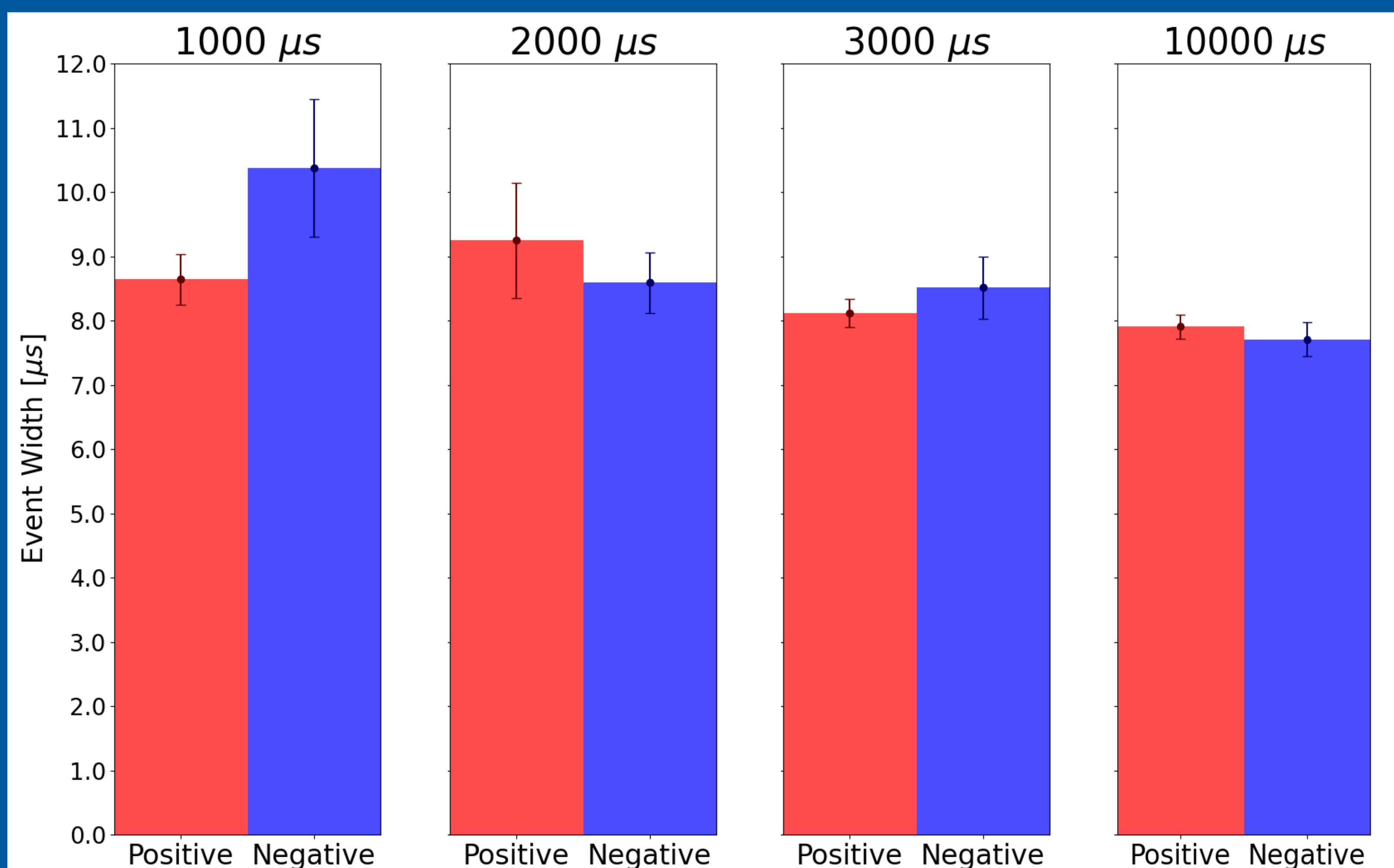
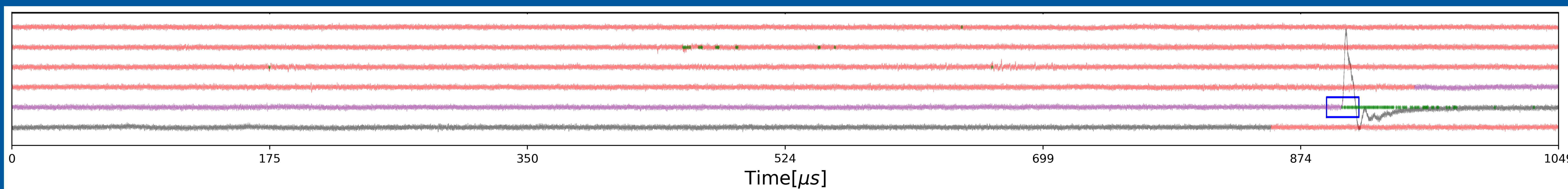
Investigating Fast Breakdown in Lightning Narrow Bipolar Events

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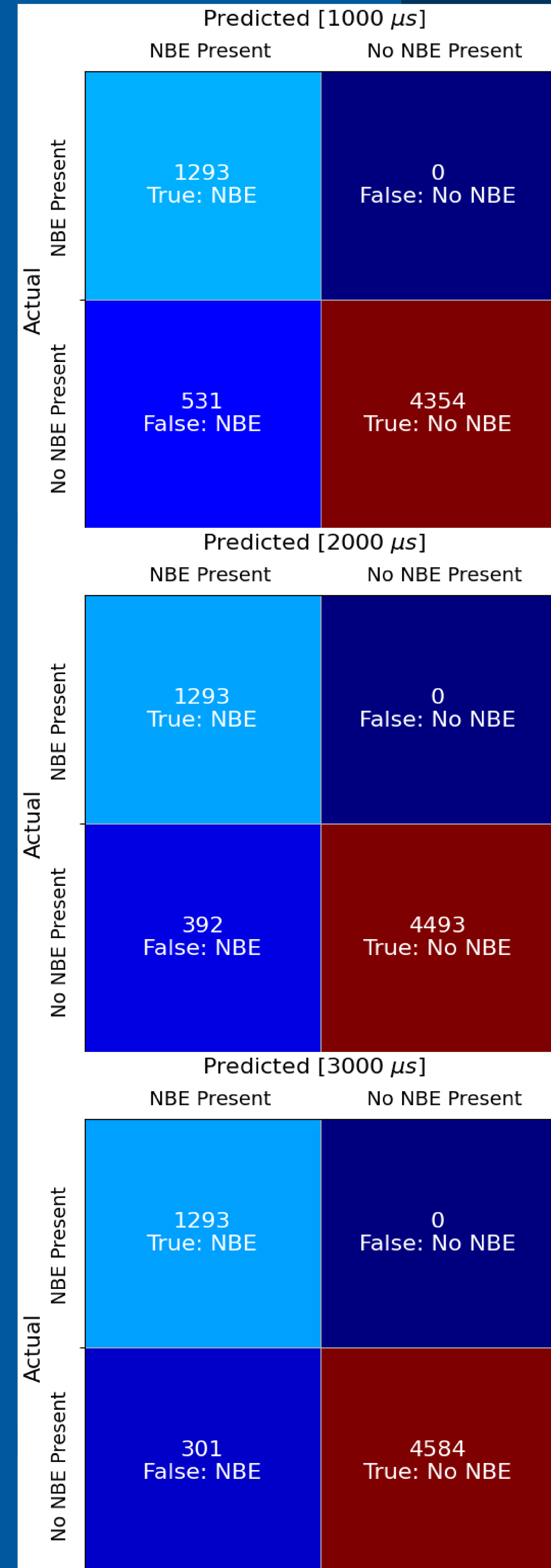
These figures represent measurements of a thunderstorm taken by the INTF array deployed to the Kennedy Space center in 2016. The array consists of three broadband VHF (20-80 MHz) radio receivers, for interferometry and a single electric-field change antenna.

The event width parameter is defined as the duration of time between the first and second detection times, represented above by the two vertical red lines. The detection times are defined as the moment the change in the electric field signal, see the blue line plot above, crosses over one of the thresholds: the horizontal lines.



To Conclude...

- 1) A Working algorithm has been created that is capable of identifying NBEs from the broader data set, collected by the INTF array.
- 2) From the script's development, a list of critical parameters regarding differentiating NBEs from the baseline has been defined.
- 3) From the large set of NBEs found, we will be able to investigate different properties of NBEs and observe how they change with breakdown polarity.
- 4) There is no significant difference in event width duration between NBEs with a negative breakdown polarity and those with a positive one.



Tilles, J., Liu, N., Stanley, M., Krehbiel, P., Rison, W., Stock, M., Dwyer, J., Brown, R., & Wilson, J. (2019). Fast negative breakdown in thunderstorms. *Nature Communications*, 10, 1648.

Liu, N., Dwyer, J. R., Tilles, J., Stanley, M. A., Krehbiel, P. R., Rison, W., et al. (2019). Understanding the radio spectrum of thunderstorm narrow bipolar events. *Journal of Geophysical Research: Atmospheres*, 124, 10134- 10153. <https://doi.org/10.1029/2019JD030439>