

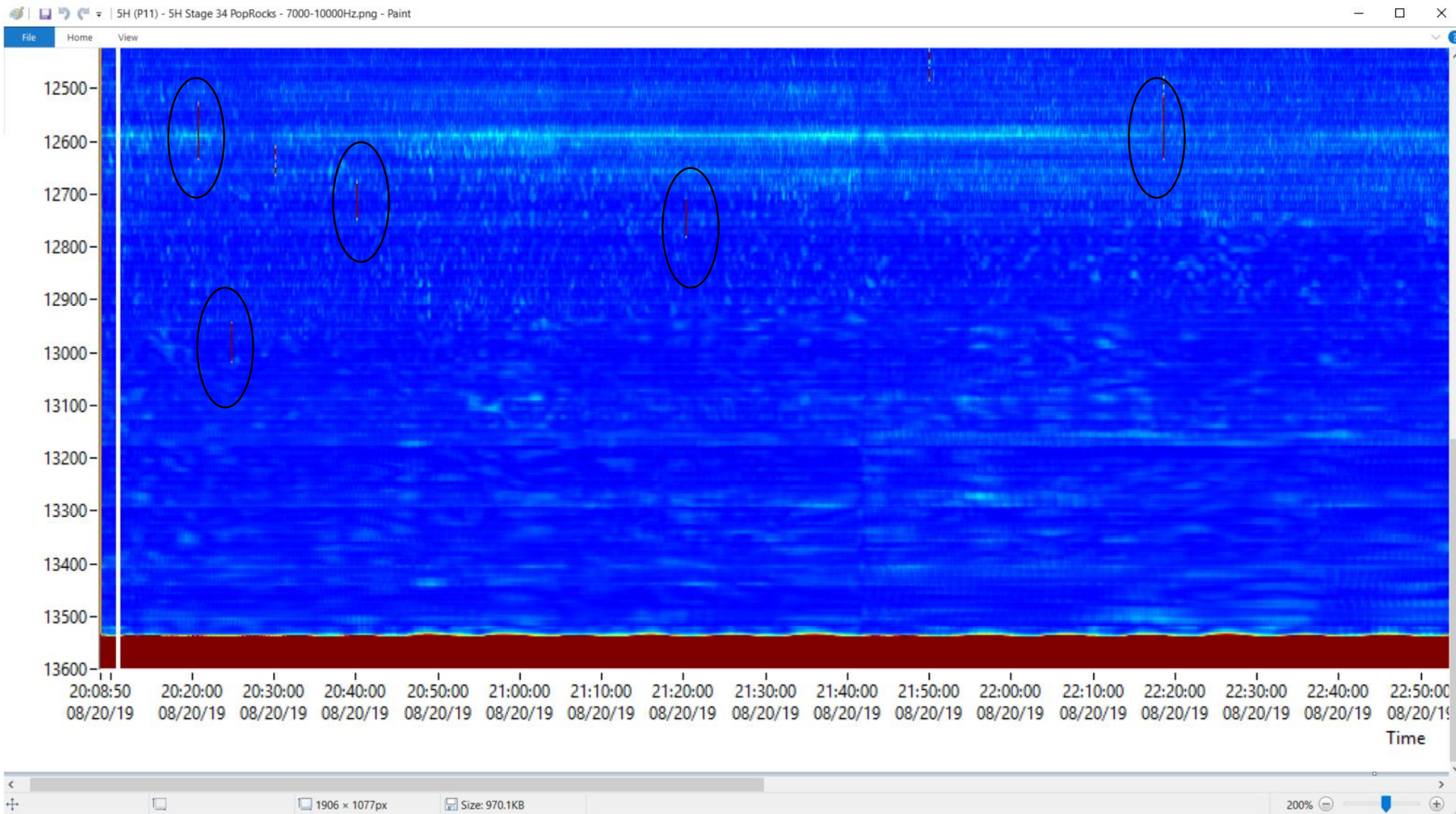


**Northeast Natural Energy
Bogges 5H Stage 34
Possible Pop Rock Waveforms**

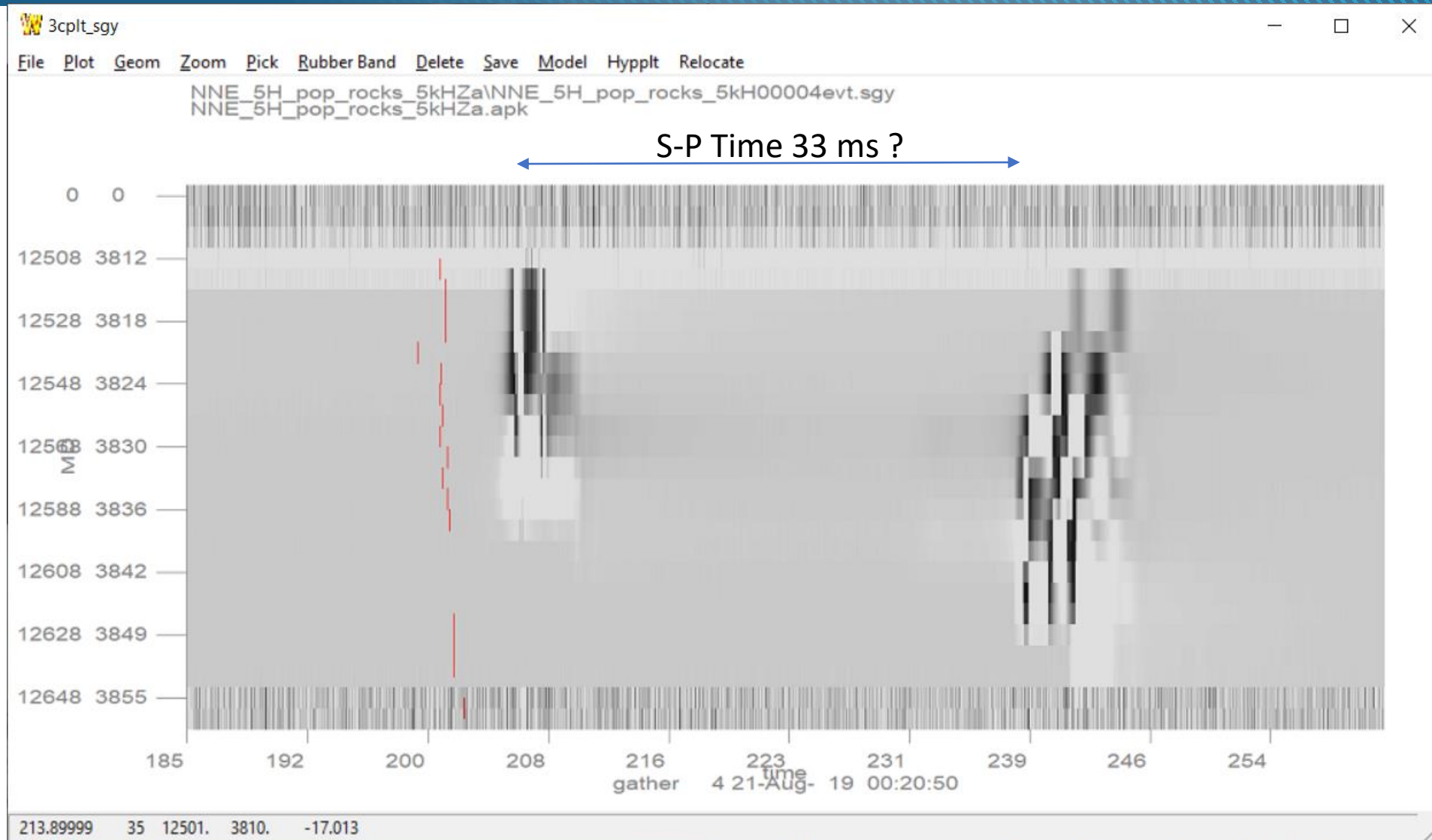
Aug 23, 2019

sense the difference

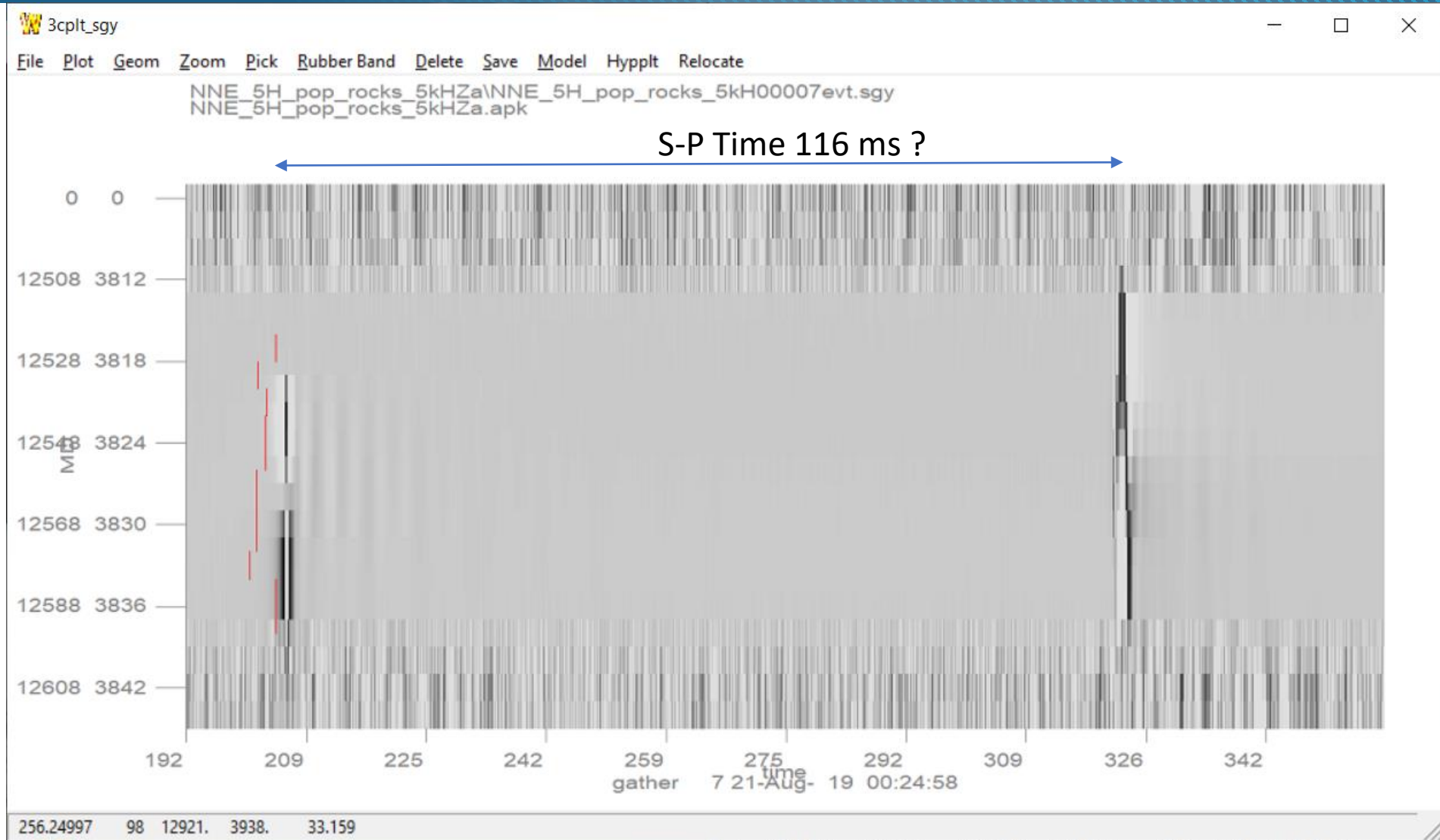
Glitches visible on Boggess 5H Fiber were detected, extracted, and plotted



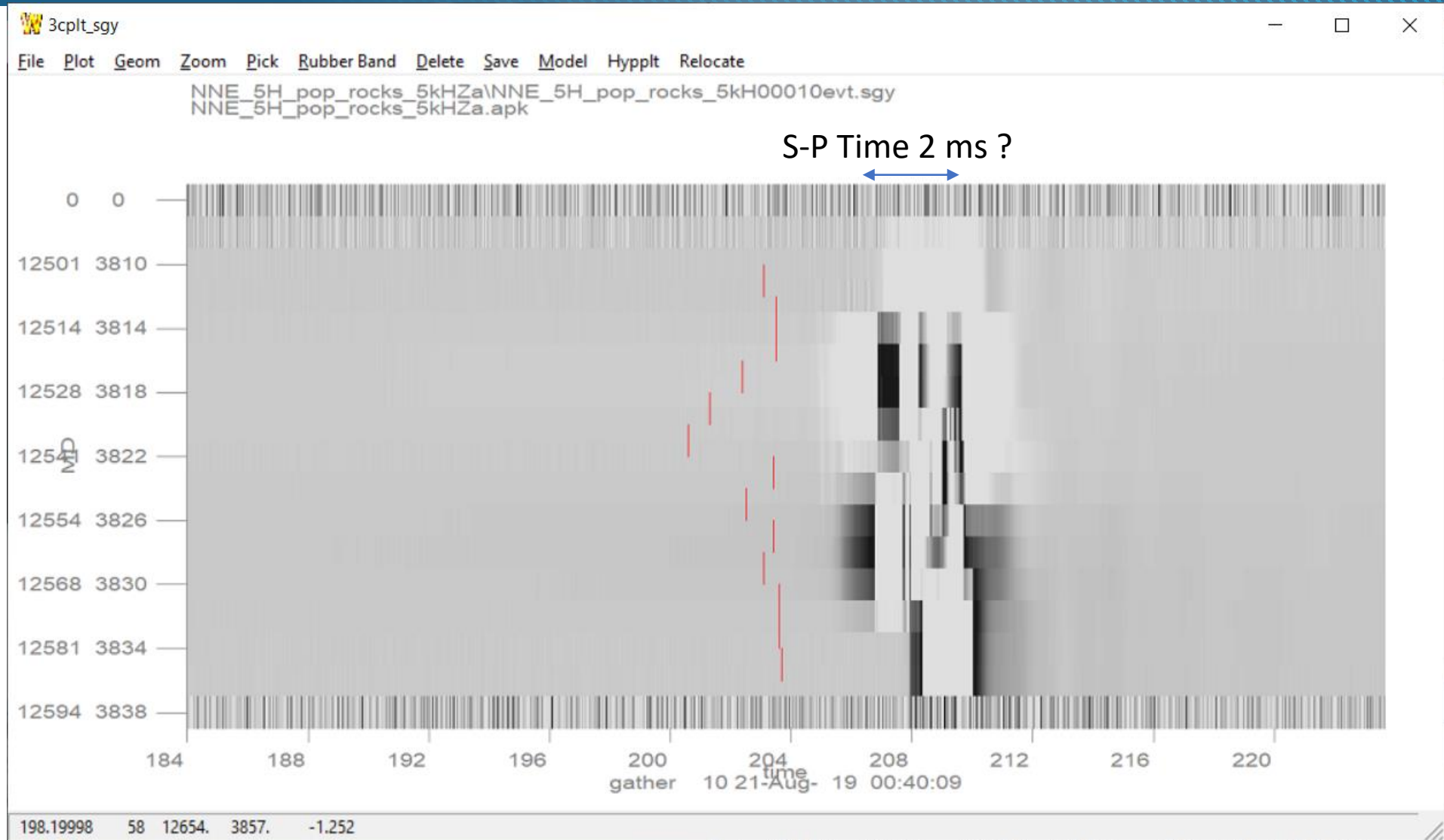
Bogges 5H Stage 34 Possible Pop Rock Waveform Aug 21 0020:50 UTC



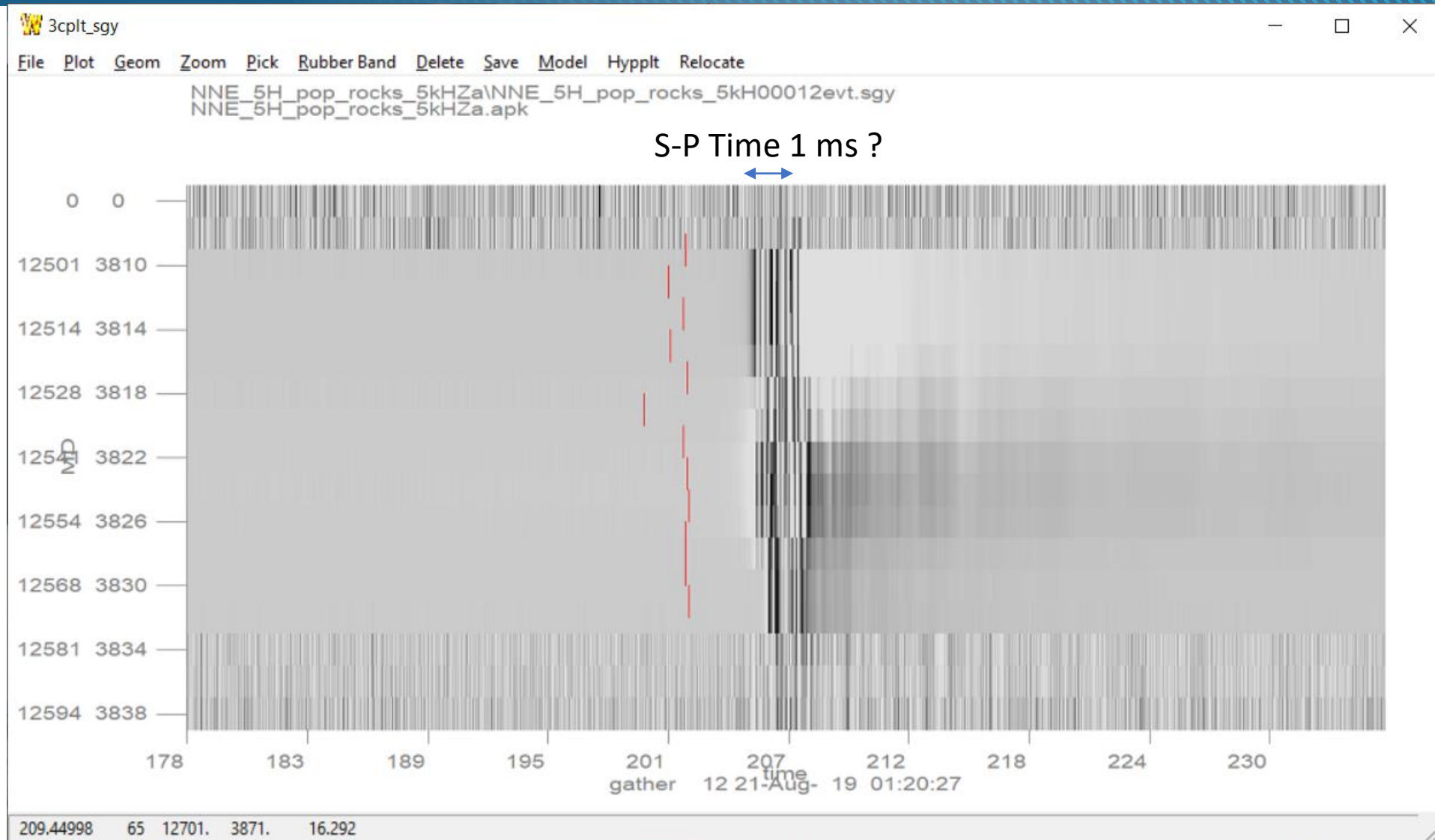
Bogges 5H Stage 34 Possible Pop Rock Waveform Aug 21 0024:58 UTC



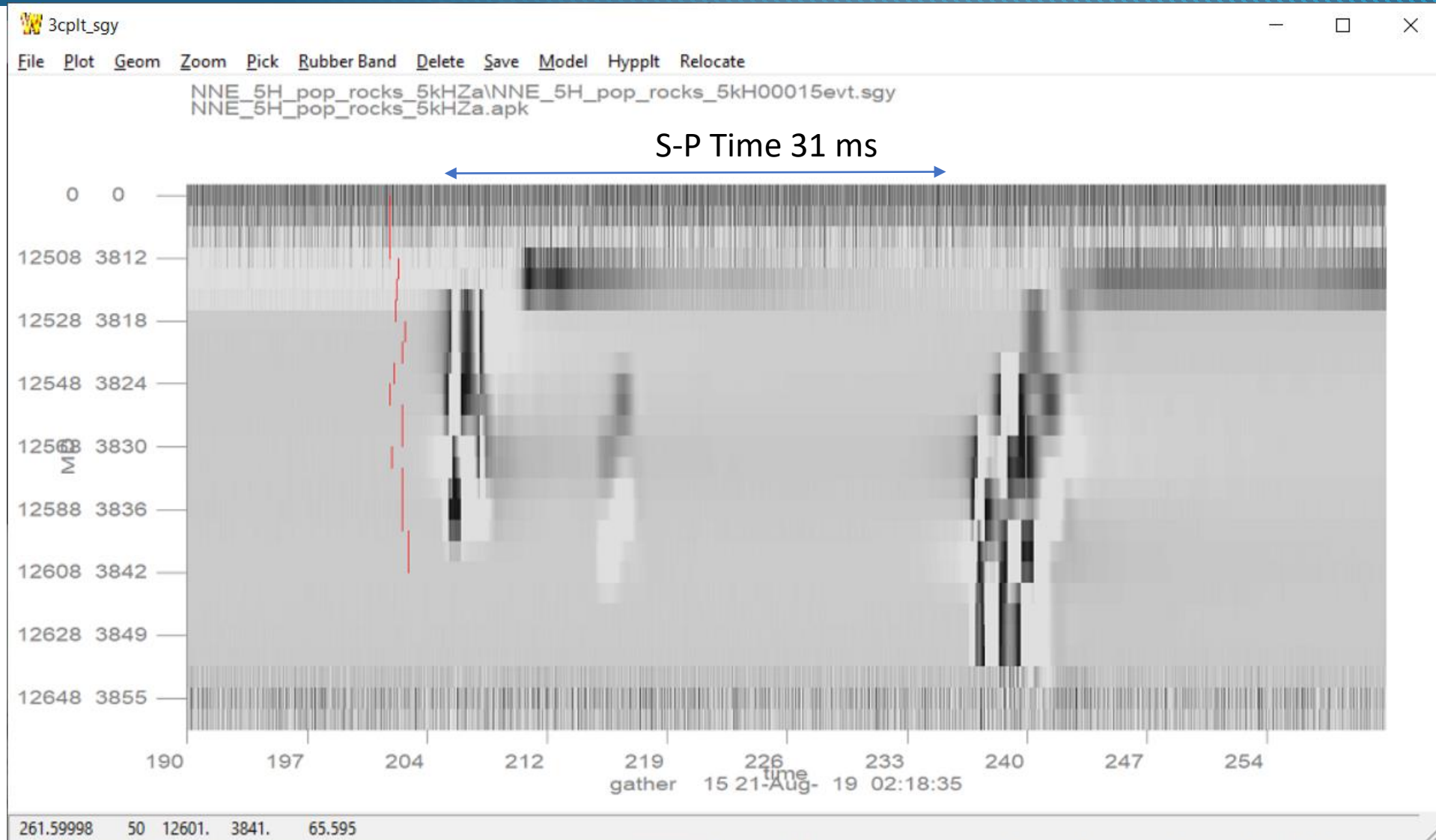
Bogges 5H Stage 34 Possible Pop Rock Waveform Aug 21 0040:09 UTC



Bogges 5H Stage 34 Possible Pop Rock Waveform Aug 21 0120:27 UTC



Bogges 5H Stage 34 Possible Pop Rock Waveform Aug 21 0218:35 UTC



Observations

1. These may be noise glitches, similar to ones observed randomly during normal operations.
2. They are very high amplitude, implying very close to the 5H fiber, possibly in the cement.
3. S-P Times greater than 2 ms (approx 50 ft) are inconsistent with such high amplitudes.
4. Apparent S-P times noted above may be random times between unrelated noise signals.
5. There is a hint of P and S moveout (slides 3 and 7), but this is difficult to measure.
6. Further study is required.