

Hydraulic Fracturing-driven Infrasonic Signals – A New Class of Signal for Subsurface Engineering

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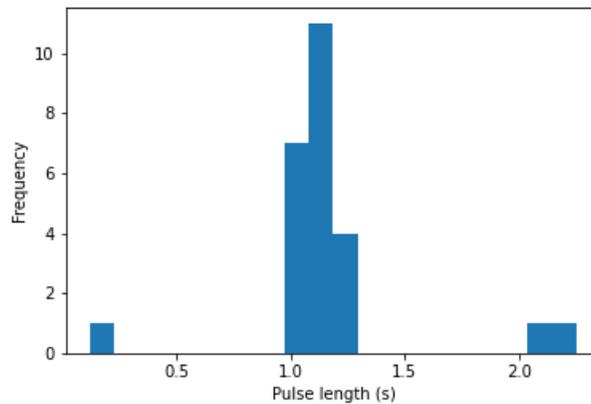


Figure S1: Histogram of infrasound pulse durations for 24 May hydrophone OT-03 (sampling rate = 200 Hz) obtained by applying STA LTA filter (short window = 300 pts, long window = 3000 pts)

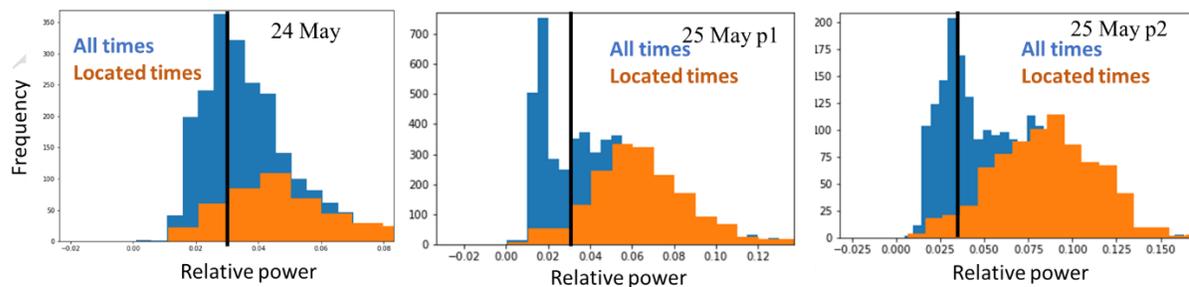


Figure S2: Histogram of beam power values showing variation of power values between located times (orange) and all data (blue). A threshold of 0.3 is determined as the beam power noise floor.

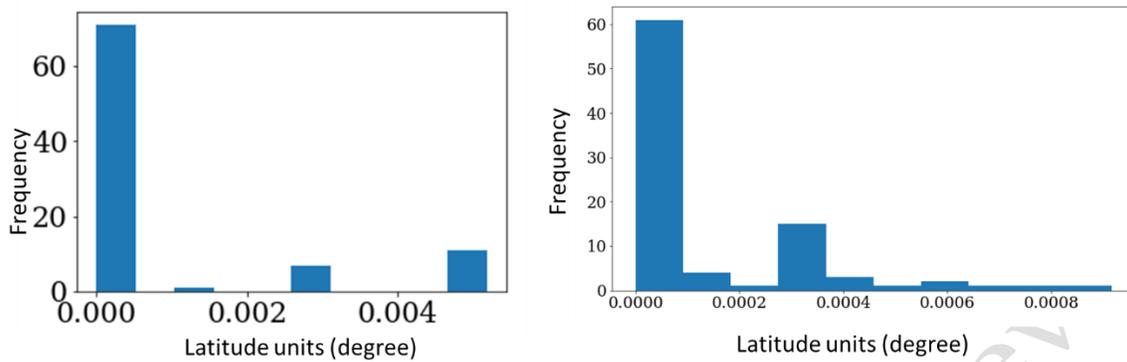


Figure S3: Horizontal scattering obtained from station bootstrapping, shown here for 24 May (left) and 25 May p1 (right). The highest 10% of scattered values are discarded.

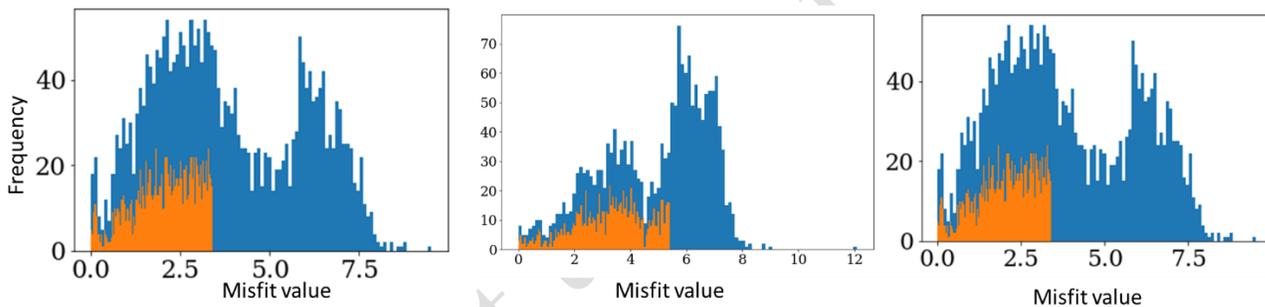


Figure S4: Histograms of misfit values obtained for 24, 25p1 and 25p2 experiments (left, center, and right respectively). Blue bars represent all misfit values and orange bars represent data with 50% of highest misfit values removed).

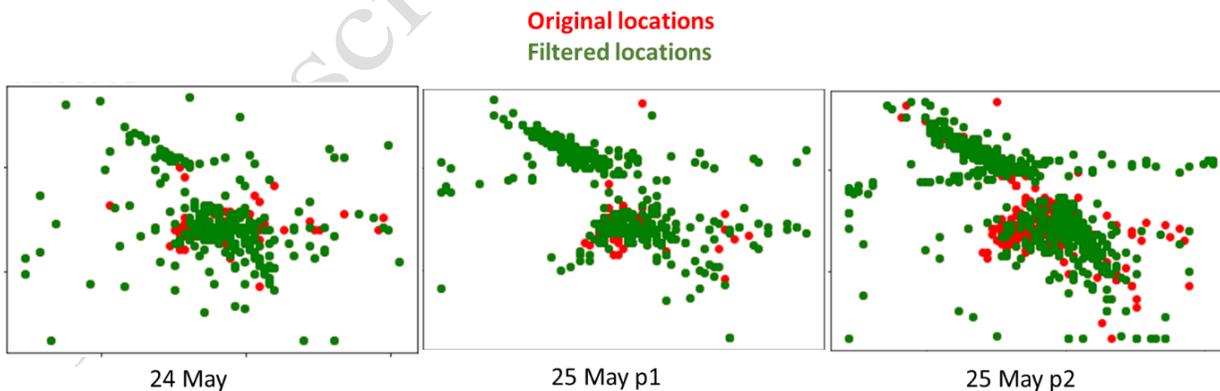


Figure S5: Effect of applying the misfit filter. Pre and post filtered data shown in red and green respectively.

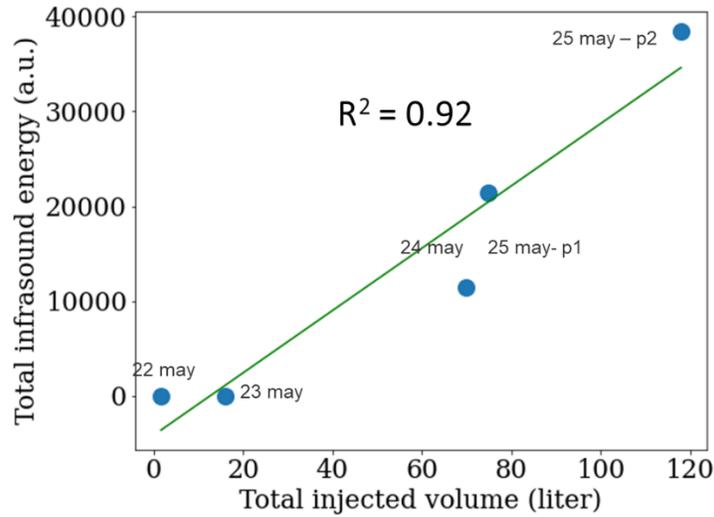


Figure S6: Dependence of cumulative infrasound (2-80 Hz) measured by combined hydrophone arrays (located on the monitoring wells E1-OT and E1-PDB).

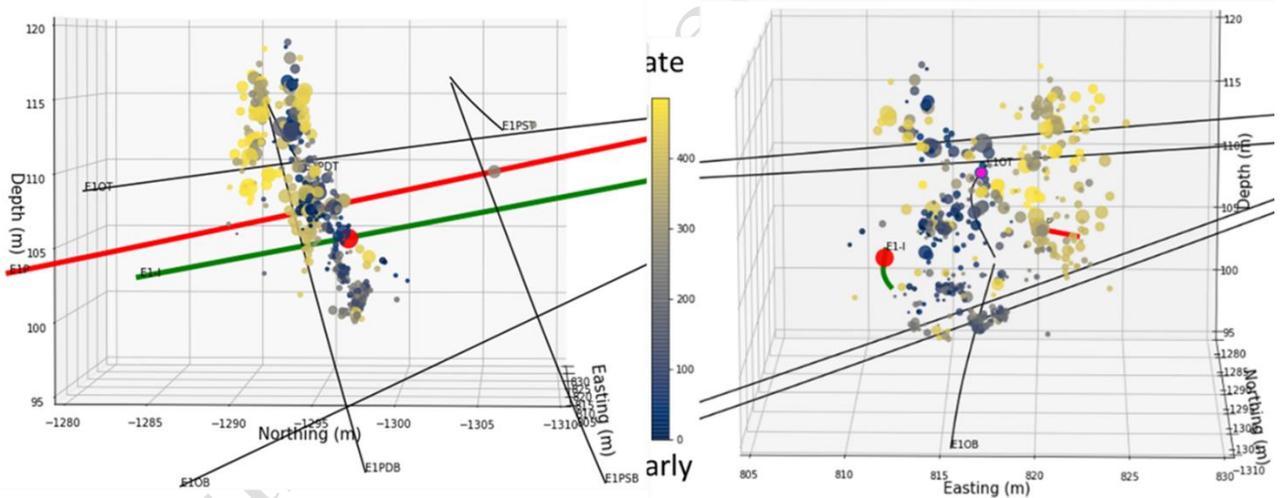


Figure S7: Relative orientation of wells E1-OT and E1-PDB microseismic cloud (combined 24 May and 25 May) with the injection and production wells (green and red, respectively).

Day (2018)	Injected volume	Description
24 May	75 L	Hydraulic fracturing
25 May – p1	77 L	Flow through fracture
25 May – p2	121 L	Flow through fracture

Table S1: Hydraulic stimulation protocol under study, stimulation carried out at the notch at 50-meter depth on the injection well E1-I.

Manuscript under review