Figure 1

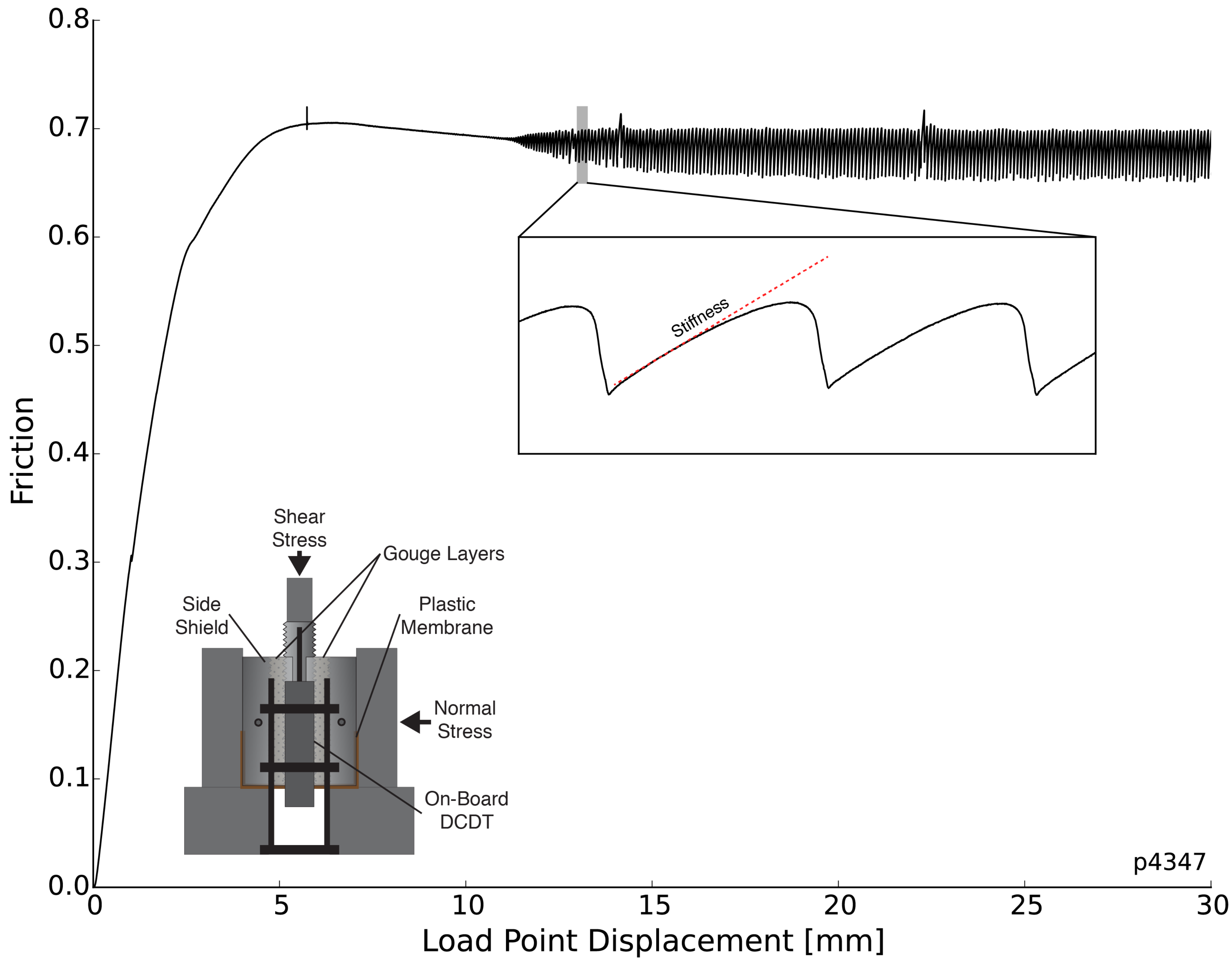


Fig. 1 - A runplot of an experiment exhibiting slow-slip behavior. Slow-slip is emergent after approximately 10 mm of shearing displacement. The stiffness of the system can be obtained from the slope of the linear-elastic loading of each slip event. All experiments were conducted in a double-direct shear configuration with an on-board displacement transducer (inset).

Figure 2

Fig. 2 - A) A range of slip behaviors is observed by modifying the system stiffness through normal stress. Faster events have a longer recurrence time and occur at lower effective stiffnesses. B) A single slow-slip event is characterized by a slip duration defined as the time from maximum to minimum friction. Peak velocity is the maximum of the velocity measured by the on-board transducer during the slip interval. C) Comparing events from three experiments in panel A, we observe that slow events have a much longer period of acceleration into slip and a slower stopping phase, producing little high frequency radiation. Faster events have much sharper and more impulsive accelerations, producing high-frequency audible emission.

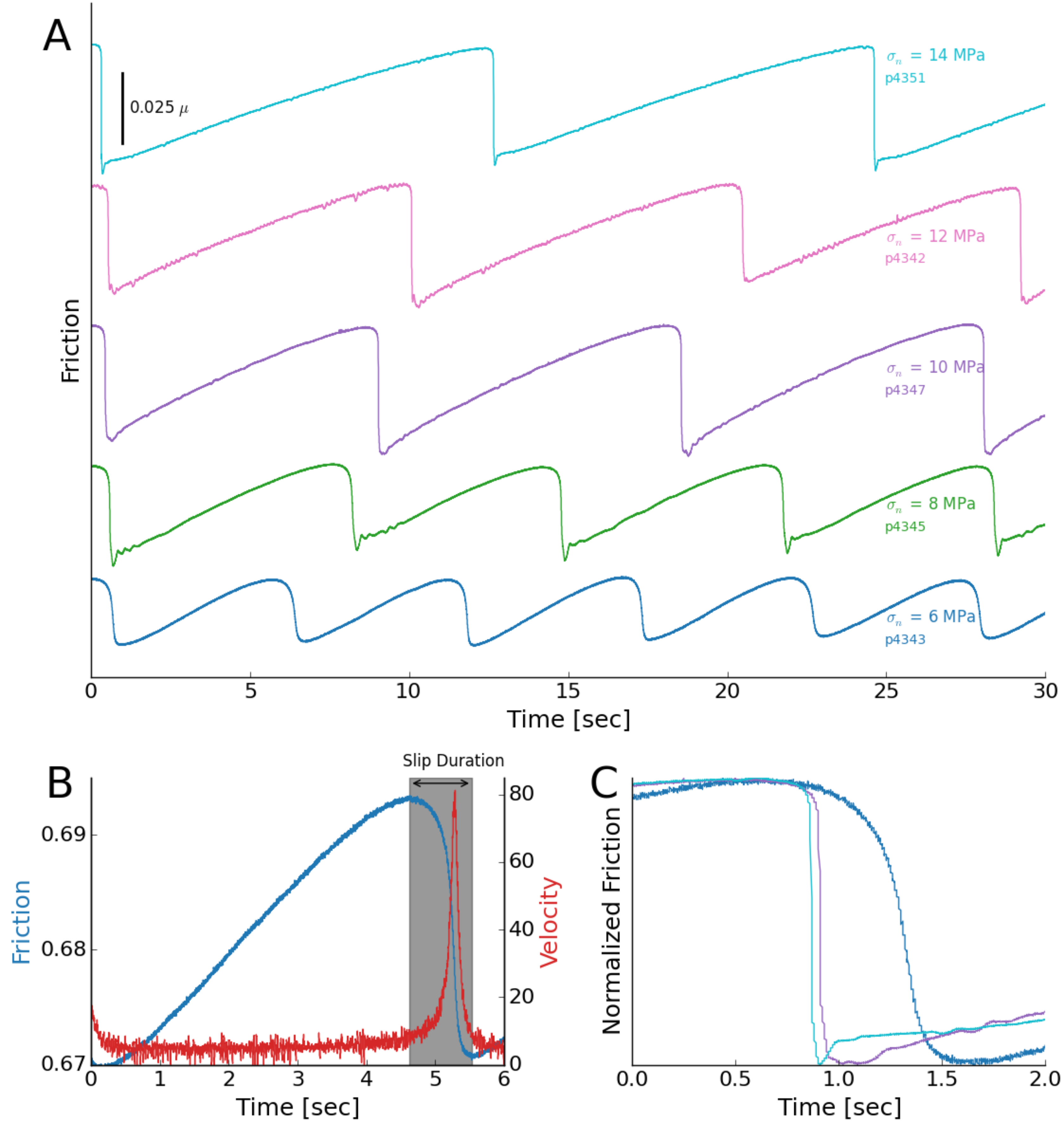


Figure 3

Fig. 3 - A) Experiments that exhibit stable behavior are clearly divided from those that were unstable by a critical stiffness value. This value evolves to a steady state as (a-b) reaches steady state. B) For unstable experiments, each event is profiled in terms of stiffness (normalized to the curve defined above) and peak slip velocity. Events further from k=kc exhibit faster slip behavior, while those in which k=kc are in the transitory stability regime.

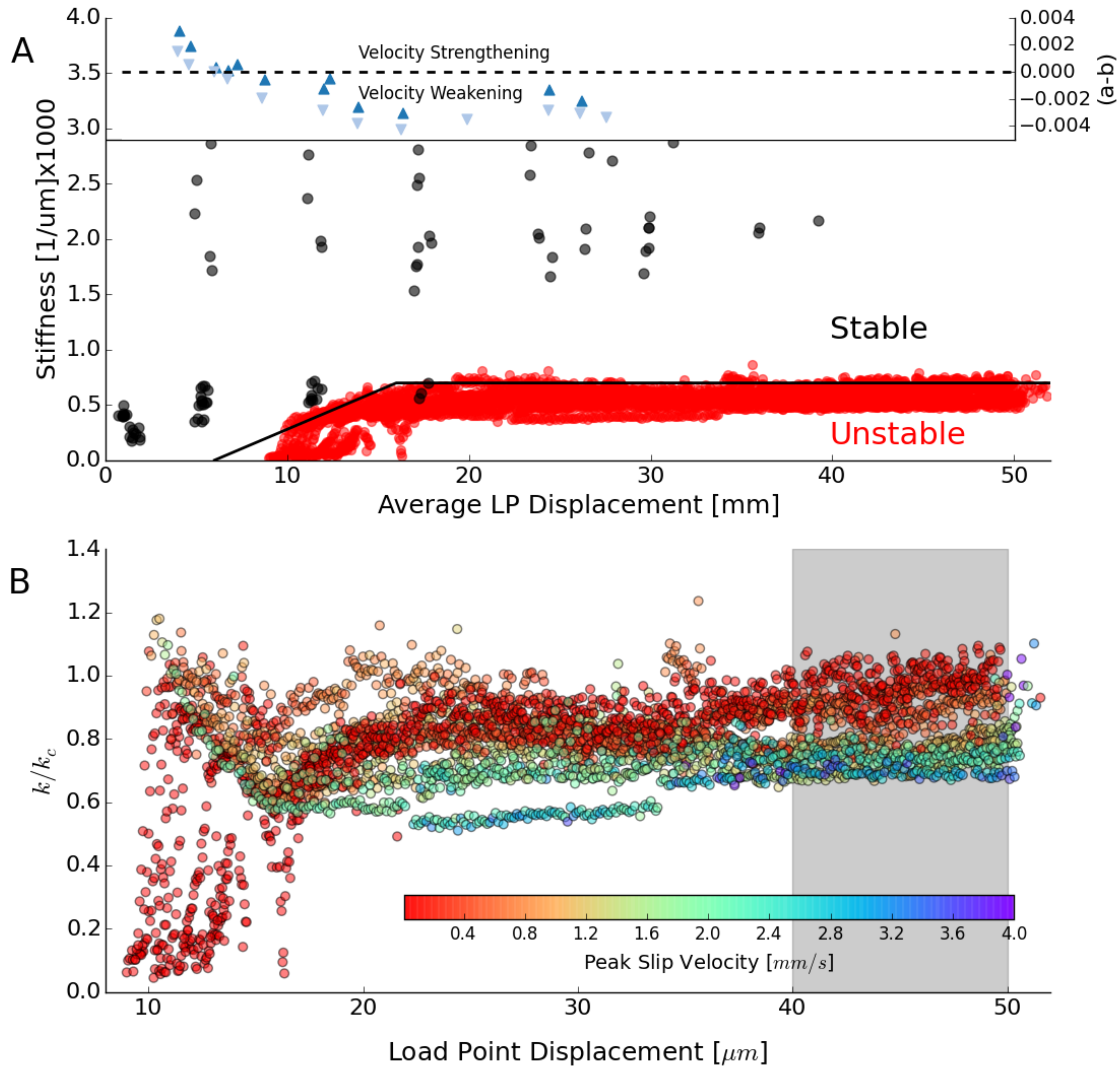


Figure 4

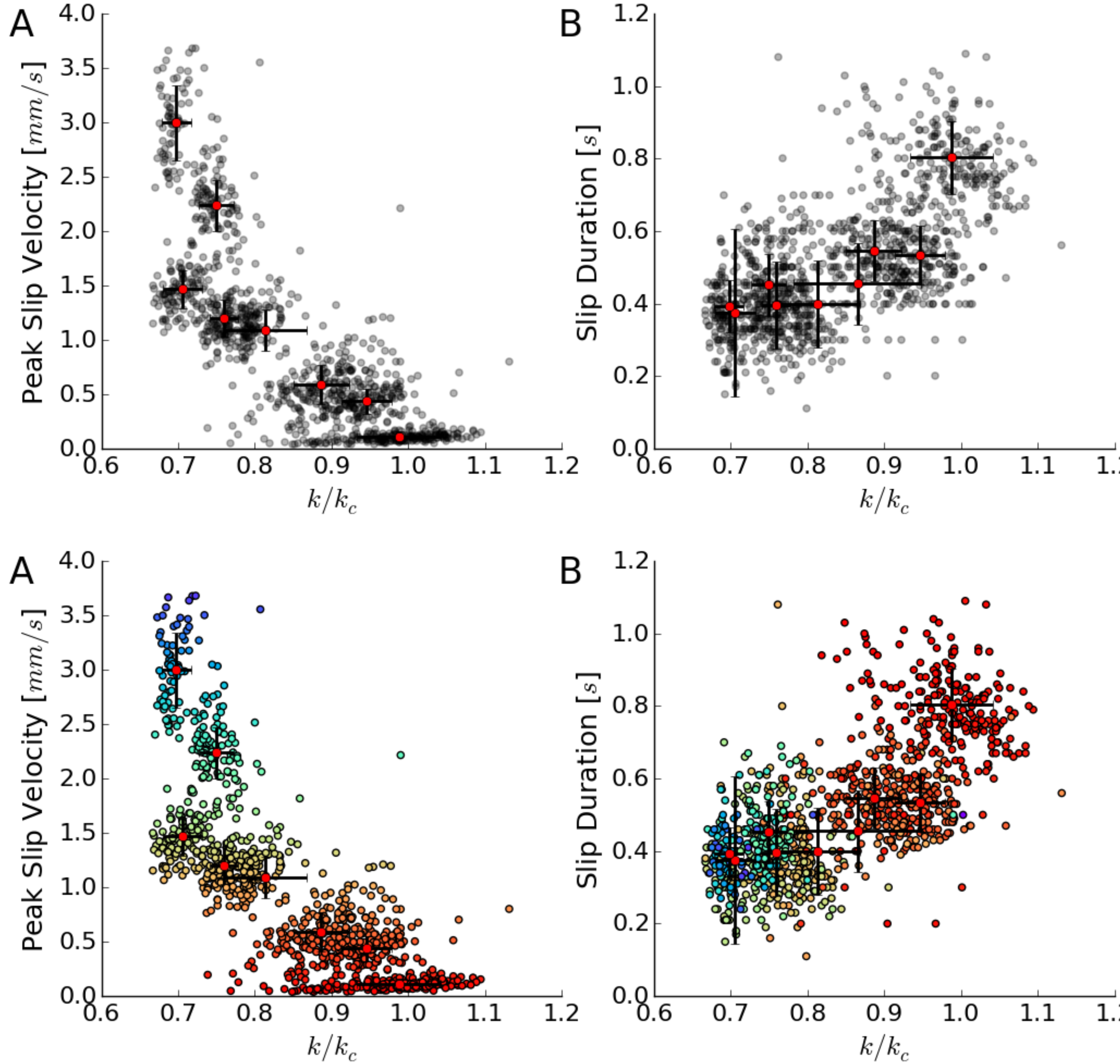
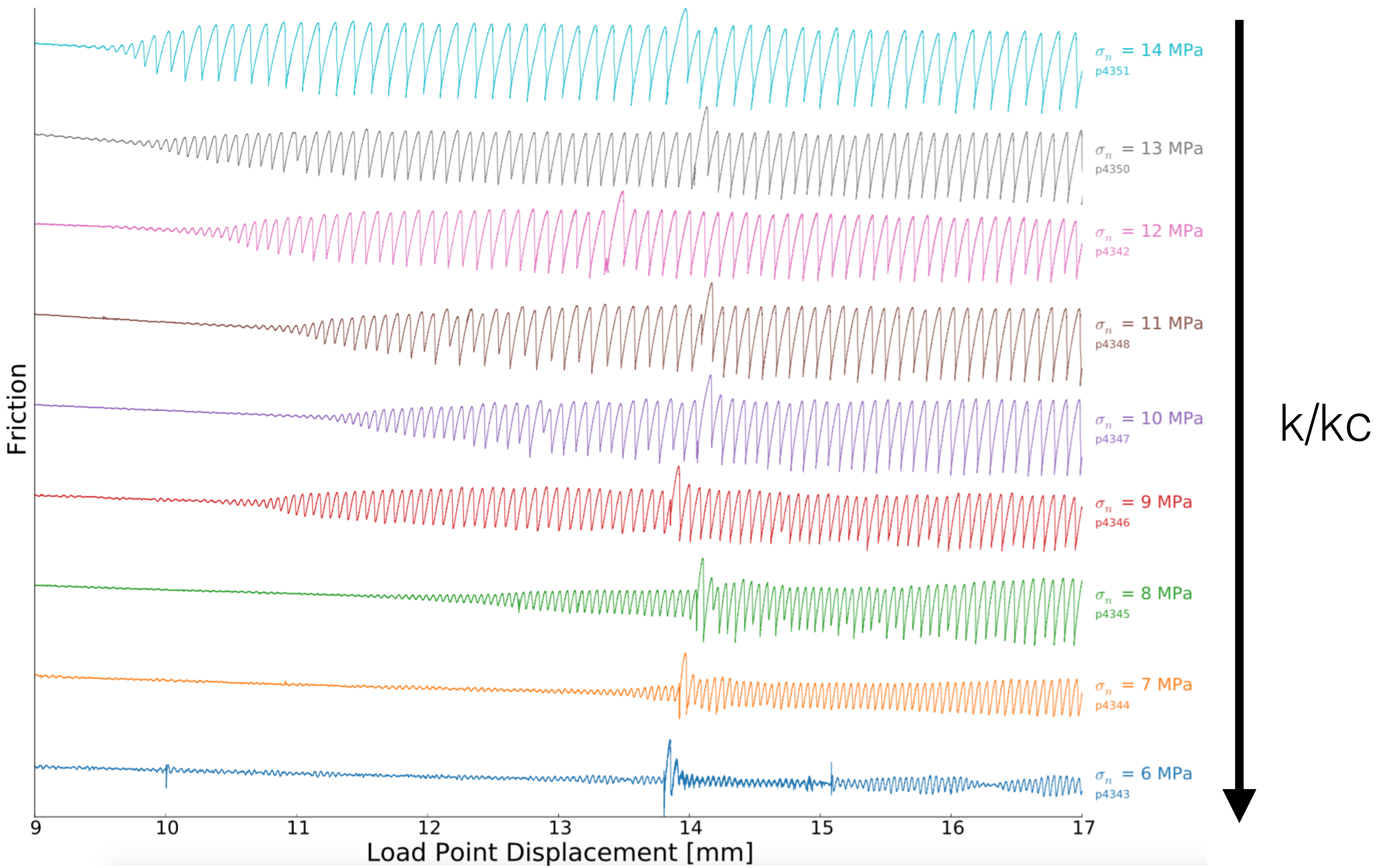


Fig. 4 - A) Peak slip velocity of each event scales linearly with the ratio of k/kc. Events that fail more slowly are much closer to the transitory k=kc. B) Slip duration (time from maximum to minimum friction) likewise scales with k/kc. All colors correspond to the color-bar of figure 3.

Figure S1



Friction
Load Point Displacement [mm]
9
10
11
12
13
14
15
16
17
σ_n = 14 MPa
p4351
σ_n = 13 MPa
p4350
σ_n = 12 MPa
p4342
σ_n = 11 MPa
p4348
σ_n = 10 MPa
p4347
σ_n = 9 MPa
p4346
σ_n = 8 MPa
p4345
σ_n = 7 MPa
p4344
σ_n = 6 MPa
p4343
k/kc