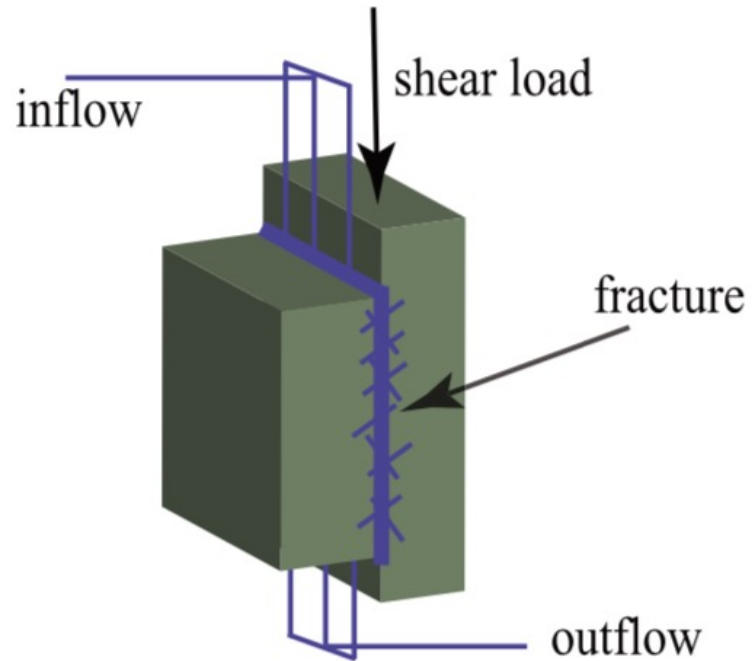
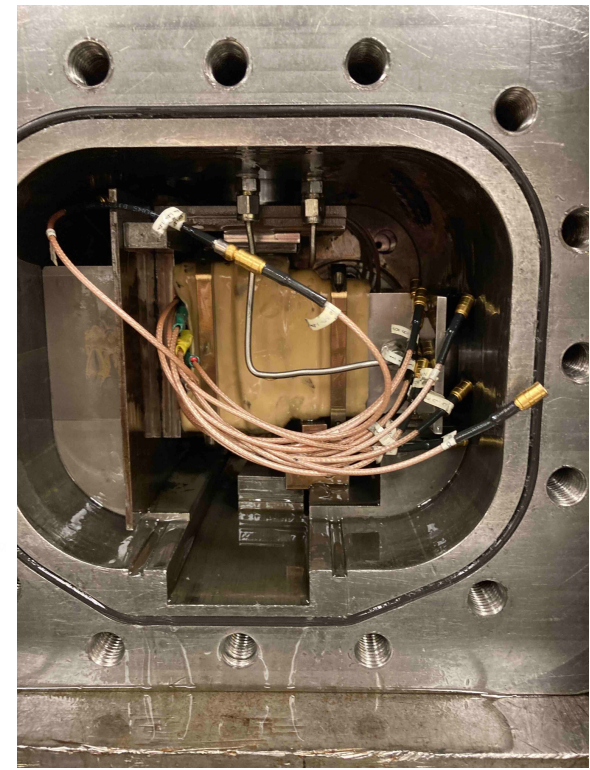
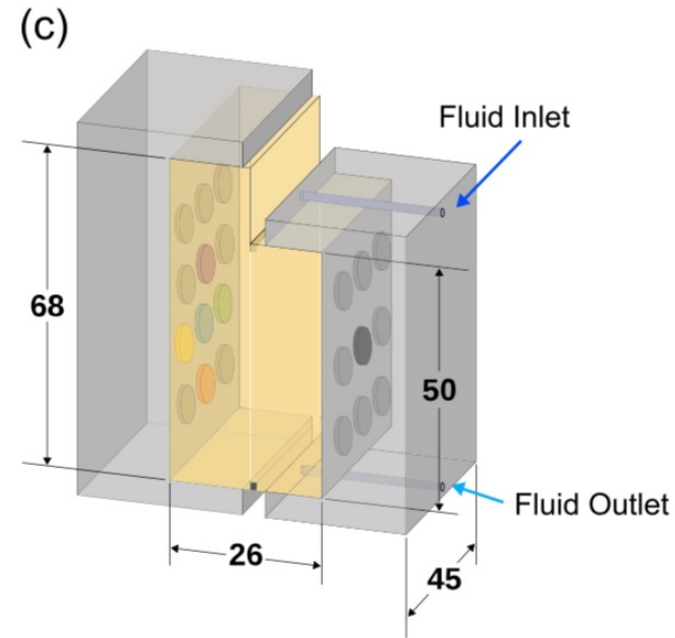


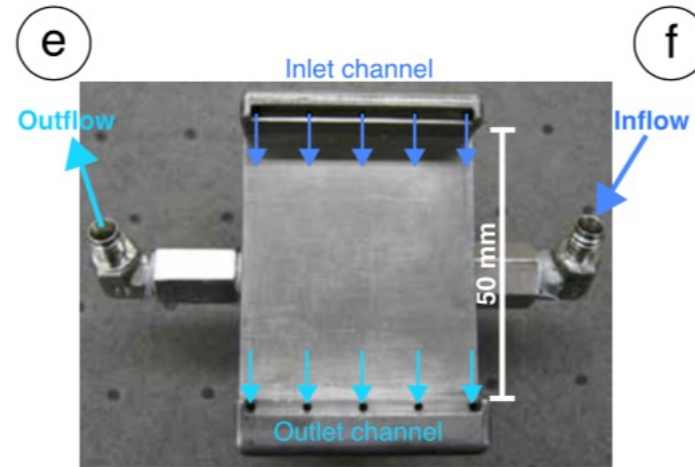
		Effective Normal Stress (MPa)	Shear velocity ( $\mu\text{m/s}$ ) SHS times (s)	Pore pressure (humidity)	Temp (C)	
p5756	Granitoid; powdered to < 125 $\mu\text{m}$ ; Initial layer thickness was 4 mm	25, 50, 75	Vsteps from 1-100 SHS 3-1000	100% RH	23	Need to finish rsf models
p5760	Gneiss powdered to < 125 $\mu\text{m}$ ; Initial layer thickness was 4 mm	50, 75, 100	Vsteps from 1-100 SHS 3-1000	100% RH	23	Need to finish rsf models
p5772	Granitoid bare surfaces	20	3 to 100	5	23	Friction section and creep section rsf modeling, acoustic data
p5791	Granitoid powder (gouge)	20	1 to 100	5	80 and 110	Friction section and creep section
p5792	l-block calibration	5, 10 25	10	0	23	Piston friction/jackets
p5793	Granitoid bare surfaces					

# L-Block single direct shear geometry

Active/Passive acoustics

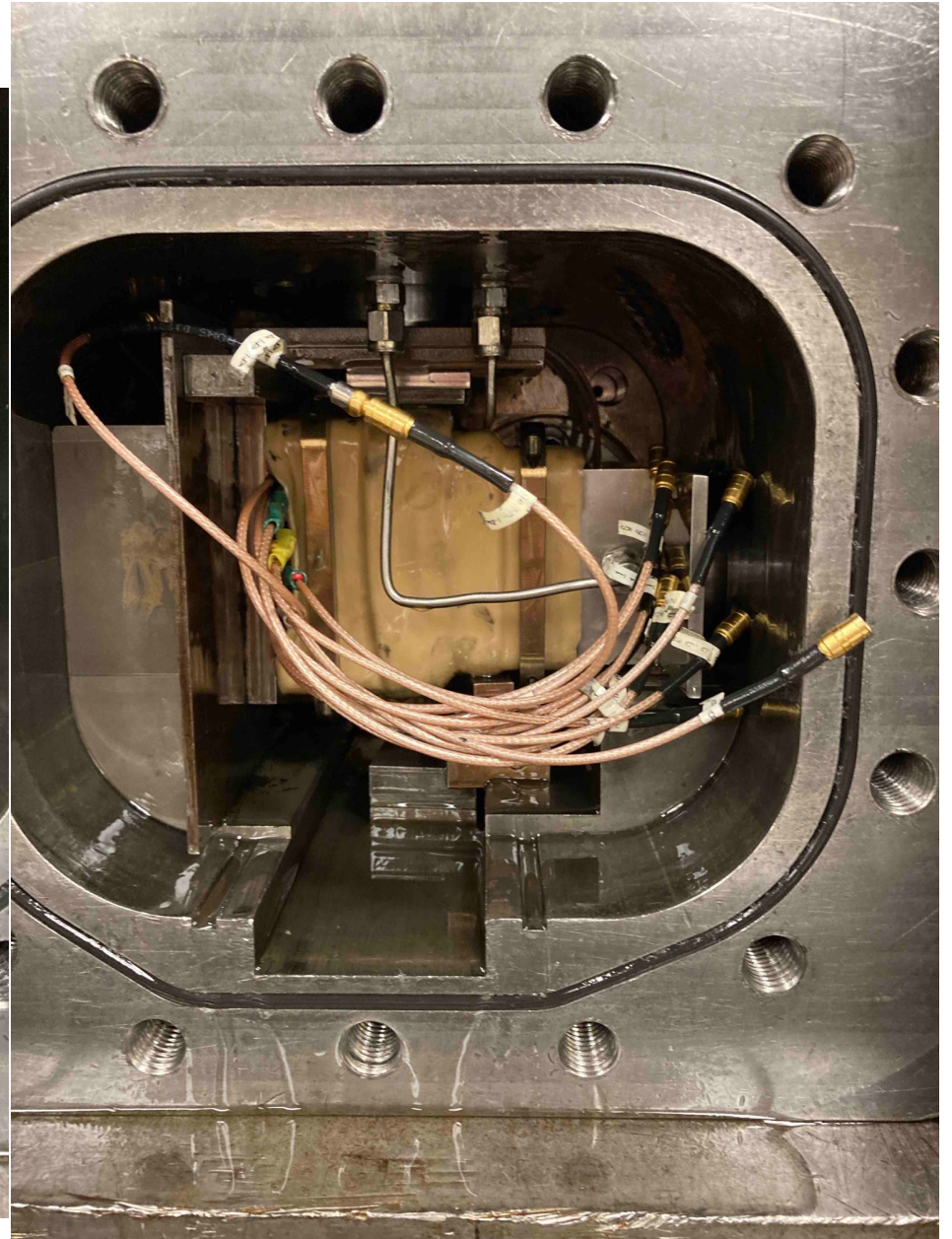
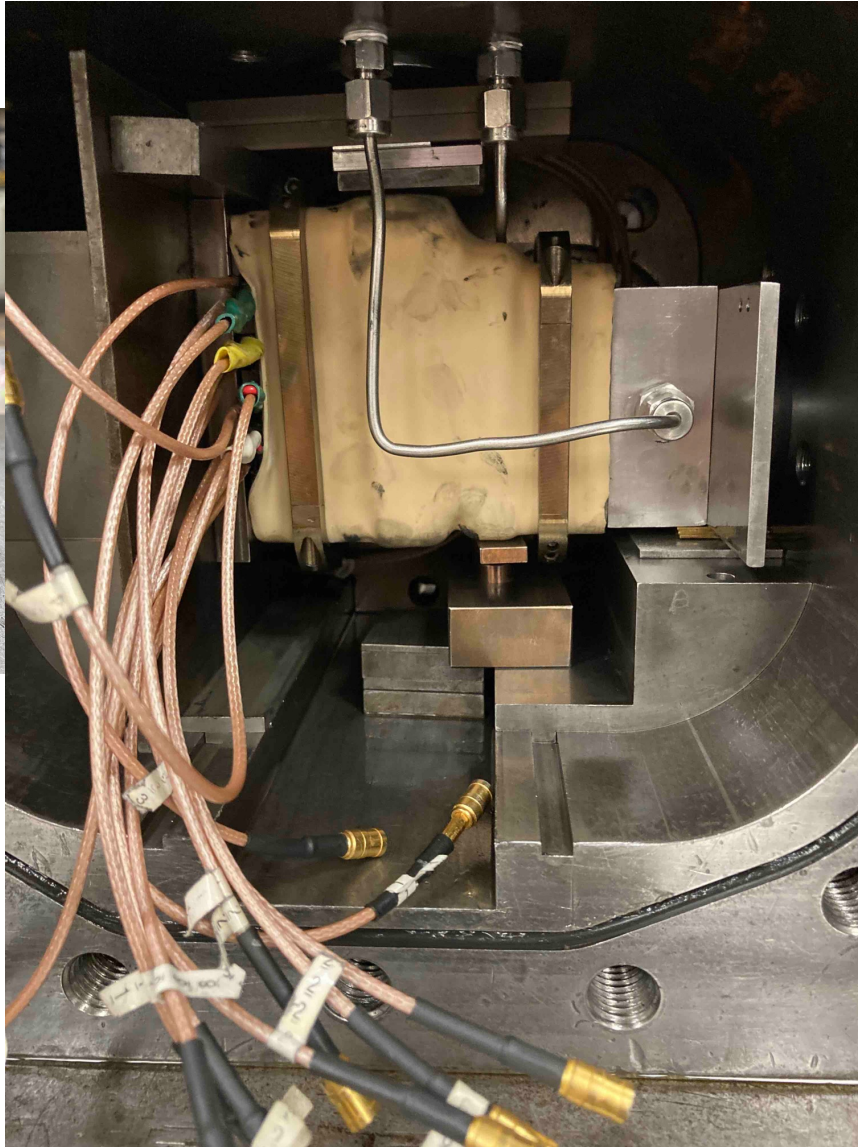
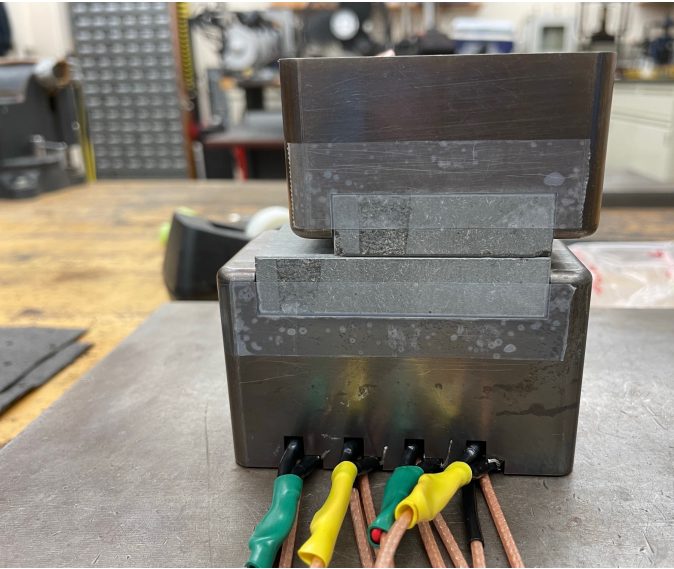


Pressure Intensifiers



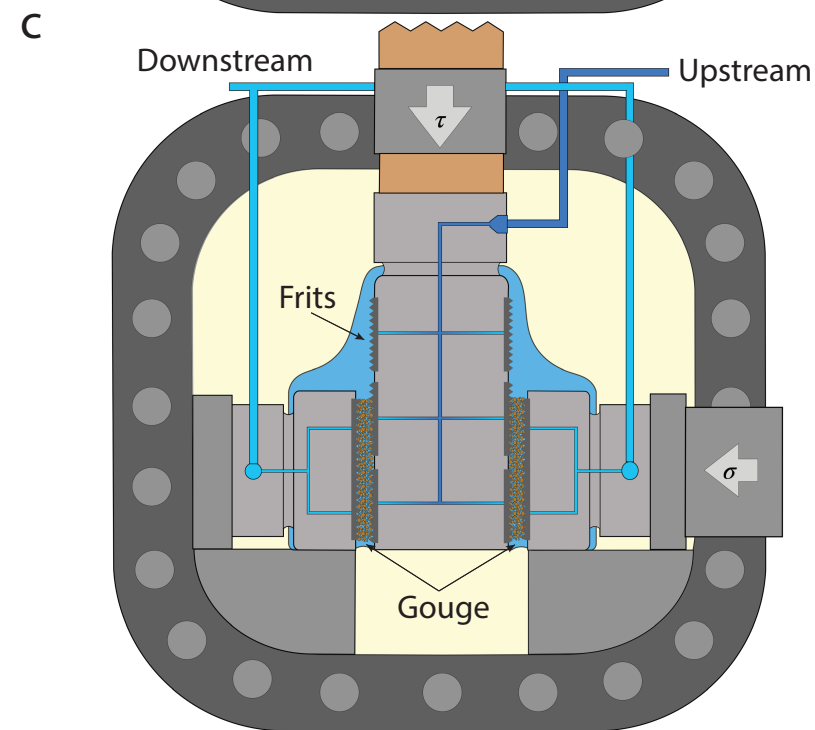
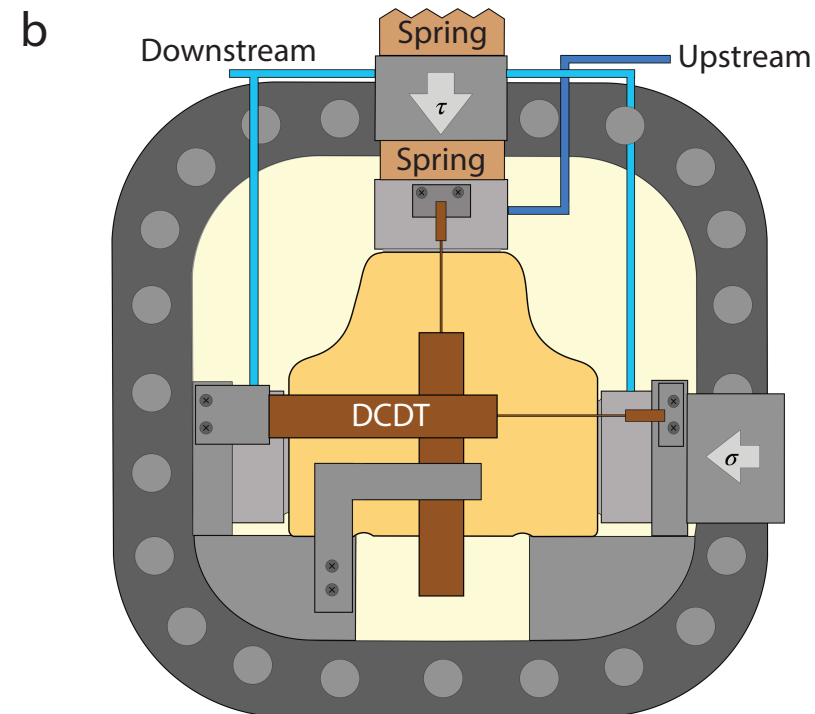
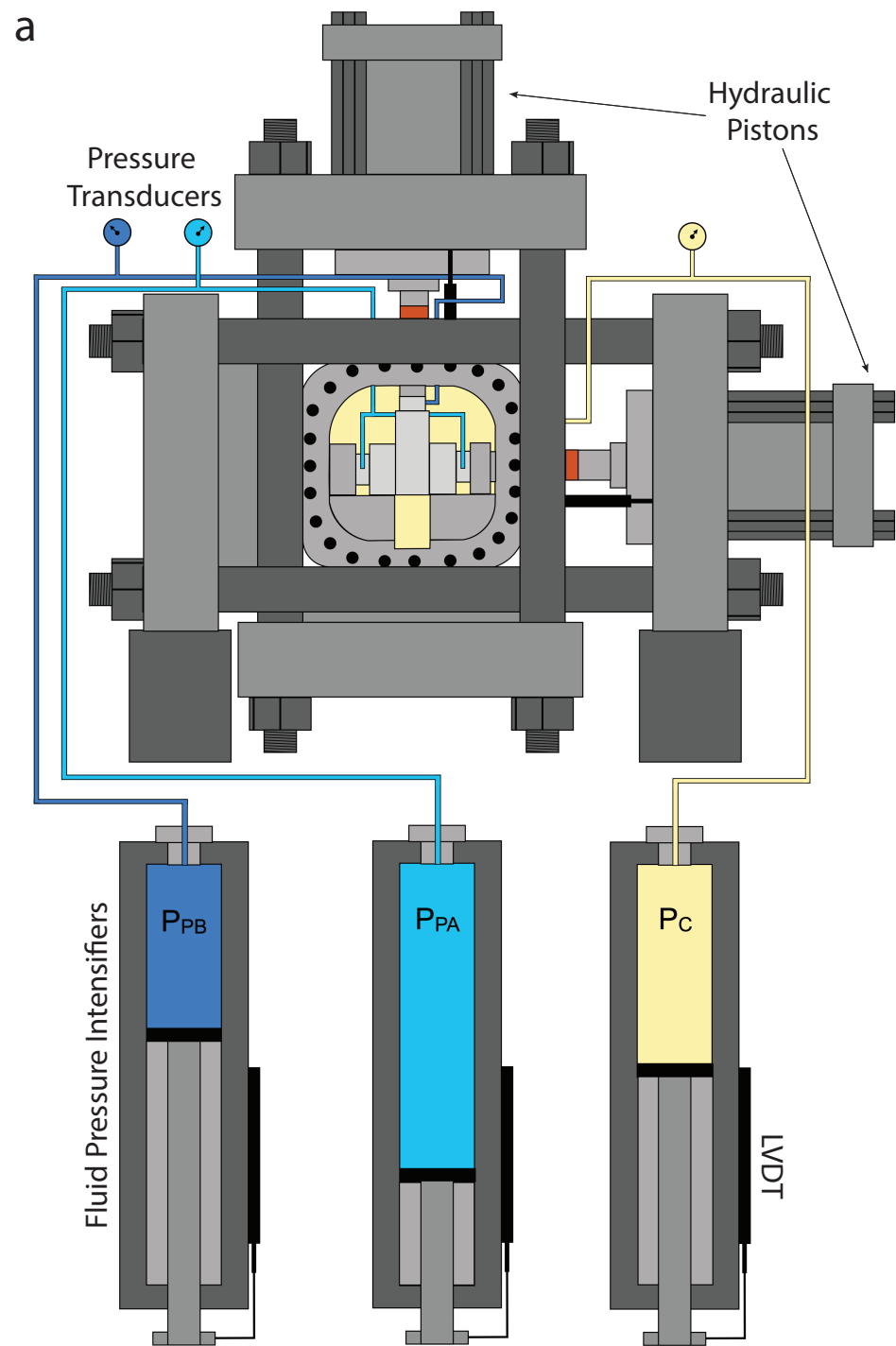
# L-Block single direct shear geometry

Active/Passive acoustics



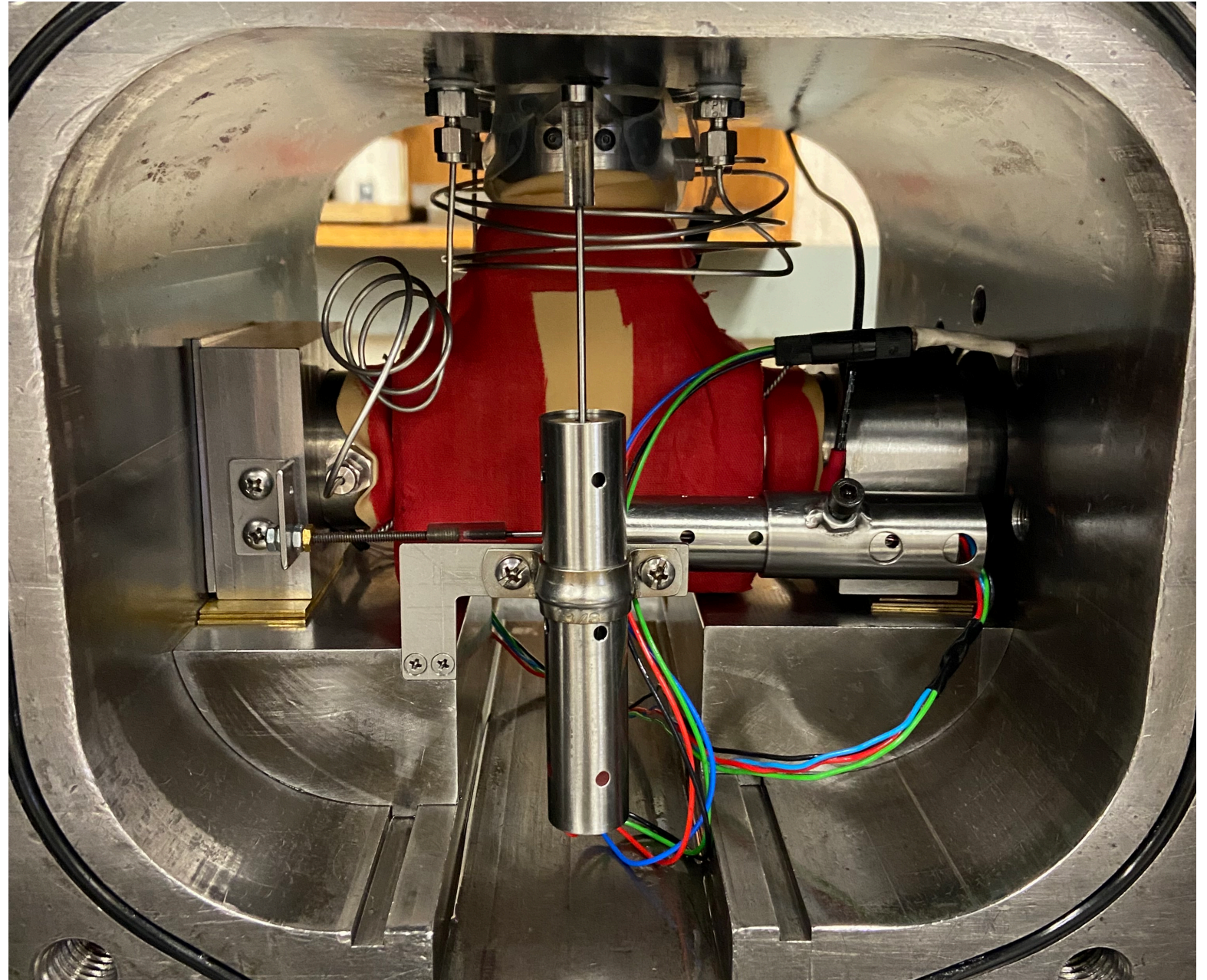
# Double direct shear geometry

Active/Passive acoustics



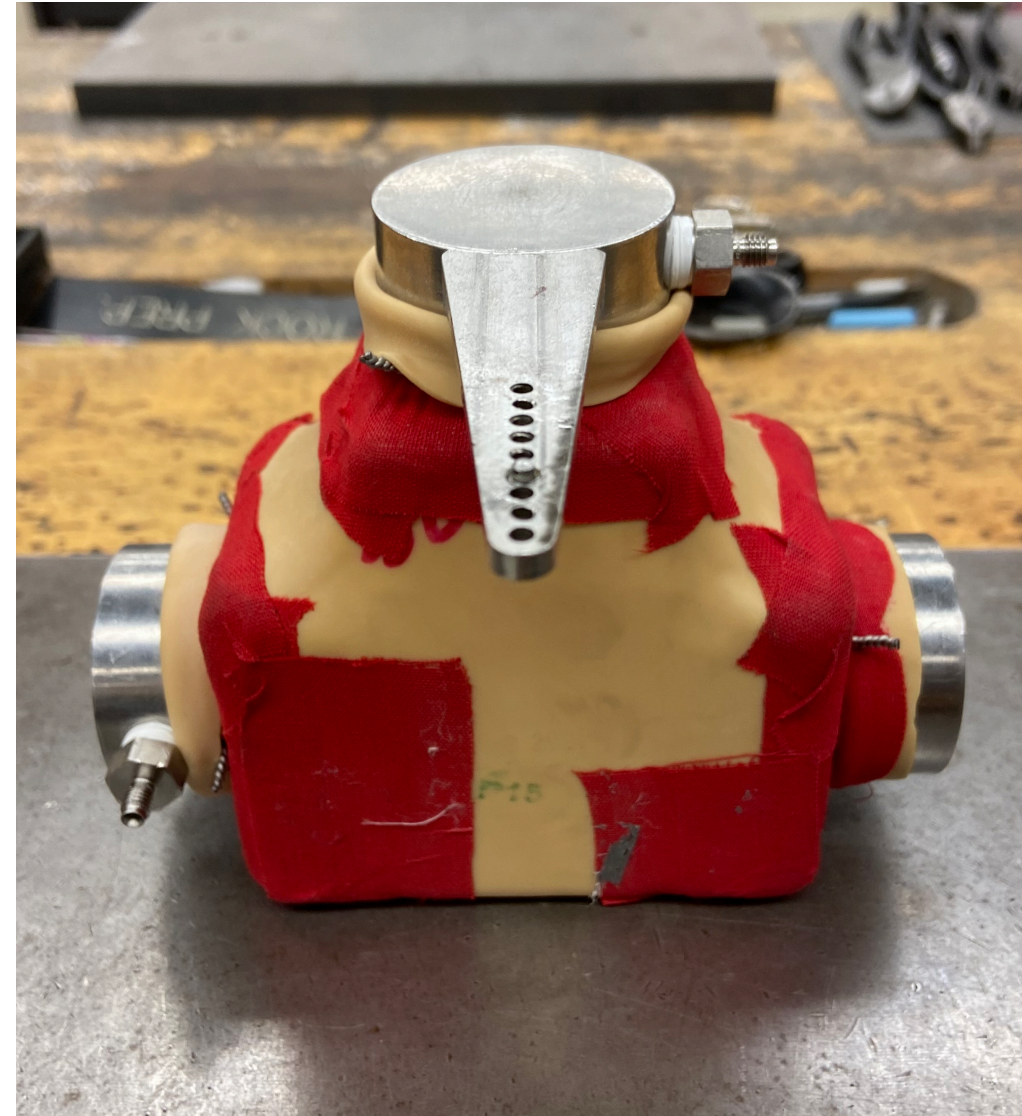
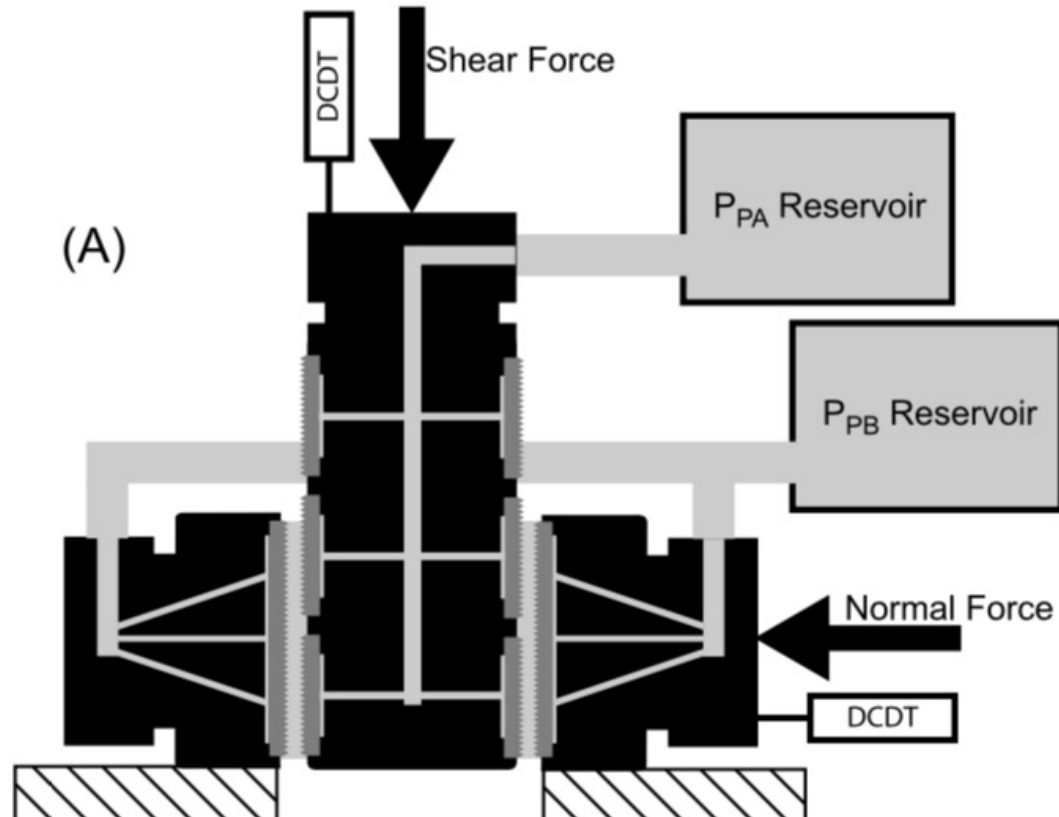
# Double direct shear geometry

Active/Passive  
acoustics

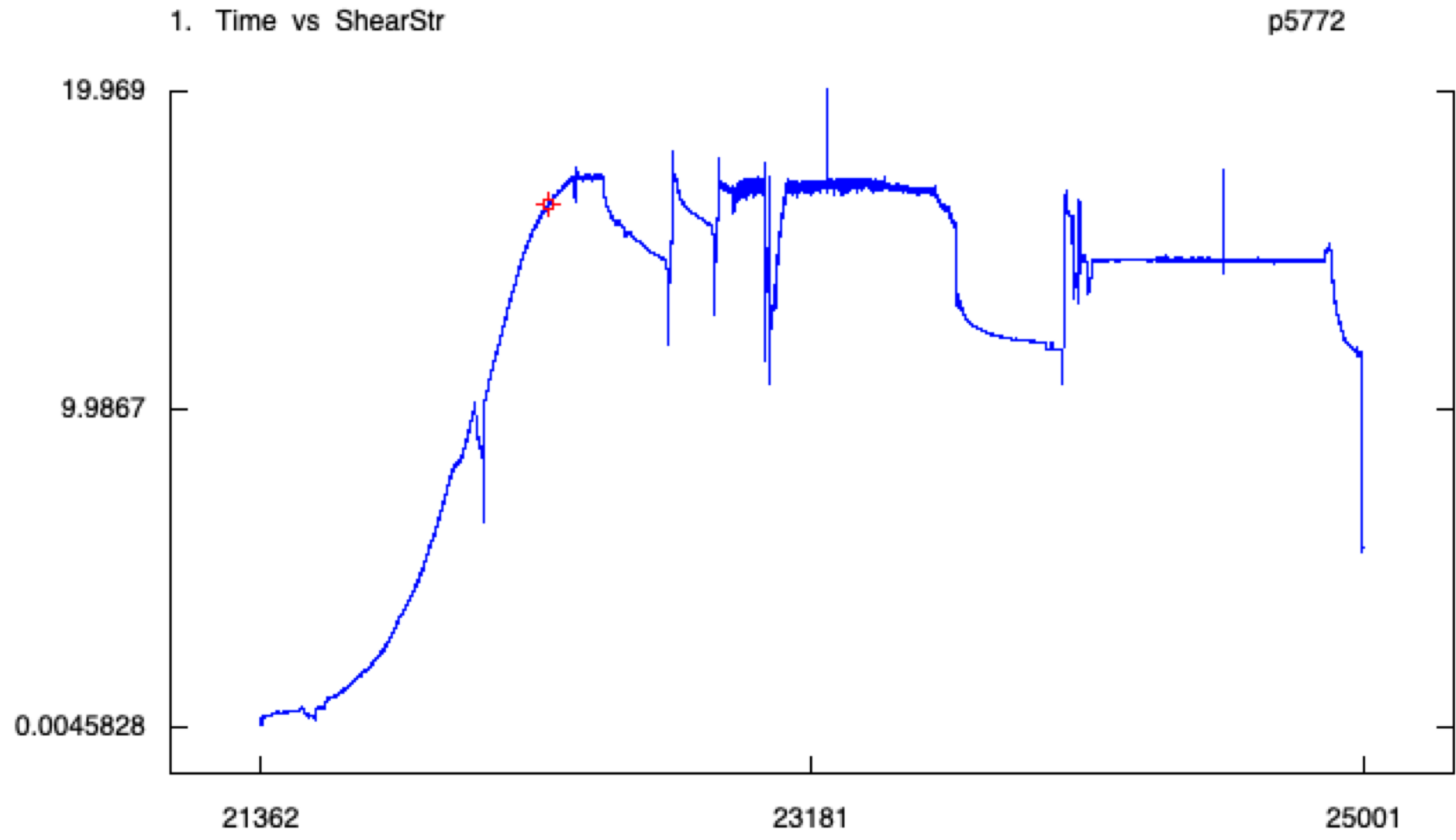


# Double direct shear geometry

Active/Passive acoustics



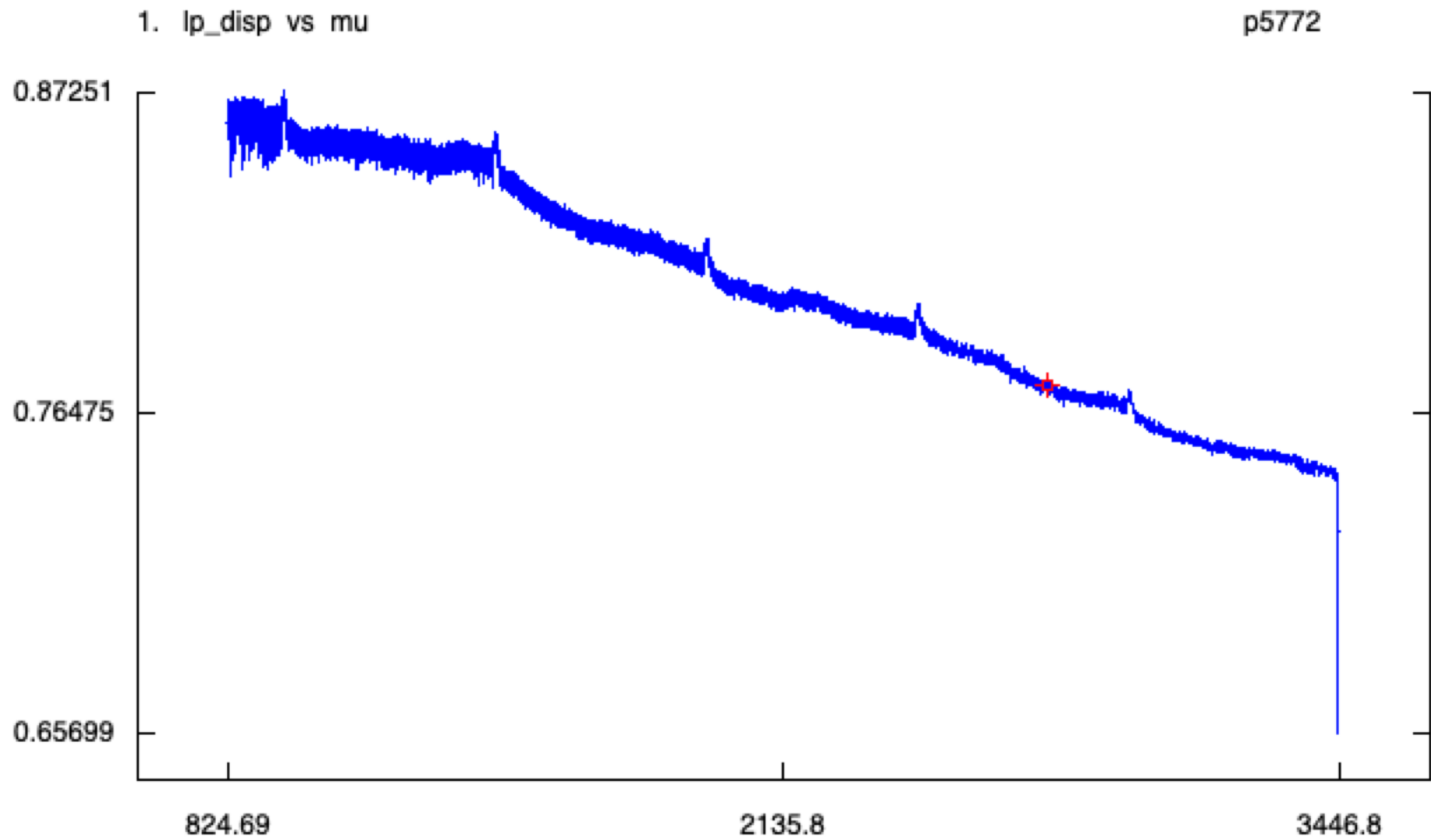
Plot Window 1  
xlook version 2.1  
Active Plot: 1. Time vs ShearStr Plot: Lines Mouse Mode: Zoom and Clear Clear Plot(s)... Clear Annotations  
X: 22319 (Data: 22319) Y: 12.301 (Data: 16.419) Row Number: 2315399 PLOT ROWS: 2305826 to 3804452



Overview of the section where we did v. steps

Zoom Mode: Left button click and drag selects zoom area.

Plot window 4  
xlook version 2.1  
Active Plot: 1. lp\_disp vs mu Plot: Lines Mouse Mode: Line Clear Plot(s)... Clear Annotations  
X: 2762.5 (Data: 2762.5) Y: 0.70306 (Data: 0.77352) Row Number: 3158915 PLOT ROWS: 2794845 to 3180245  
Last Click: X: 1580.1 Y: 0.60701



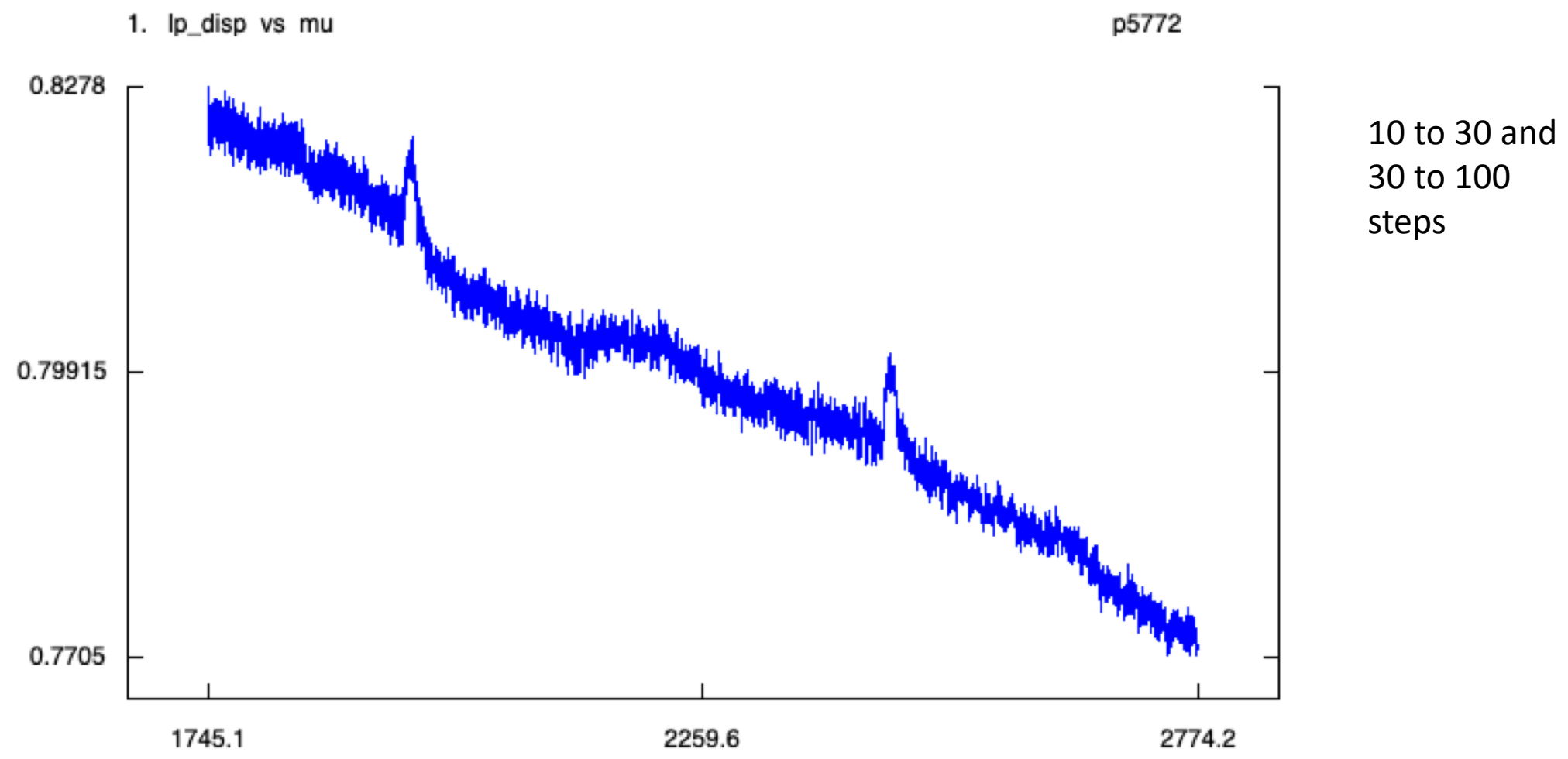
Fric disp. plot showing weakening trend

It's a simple linear trend.



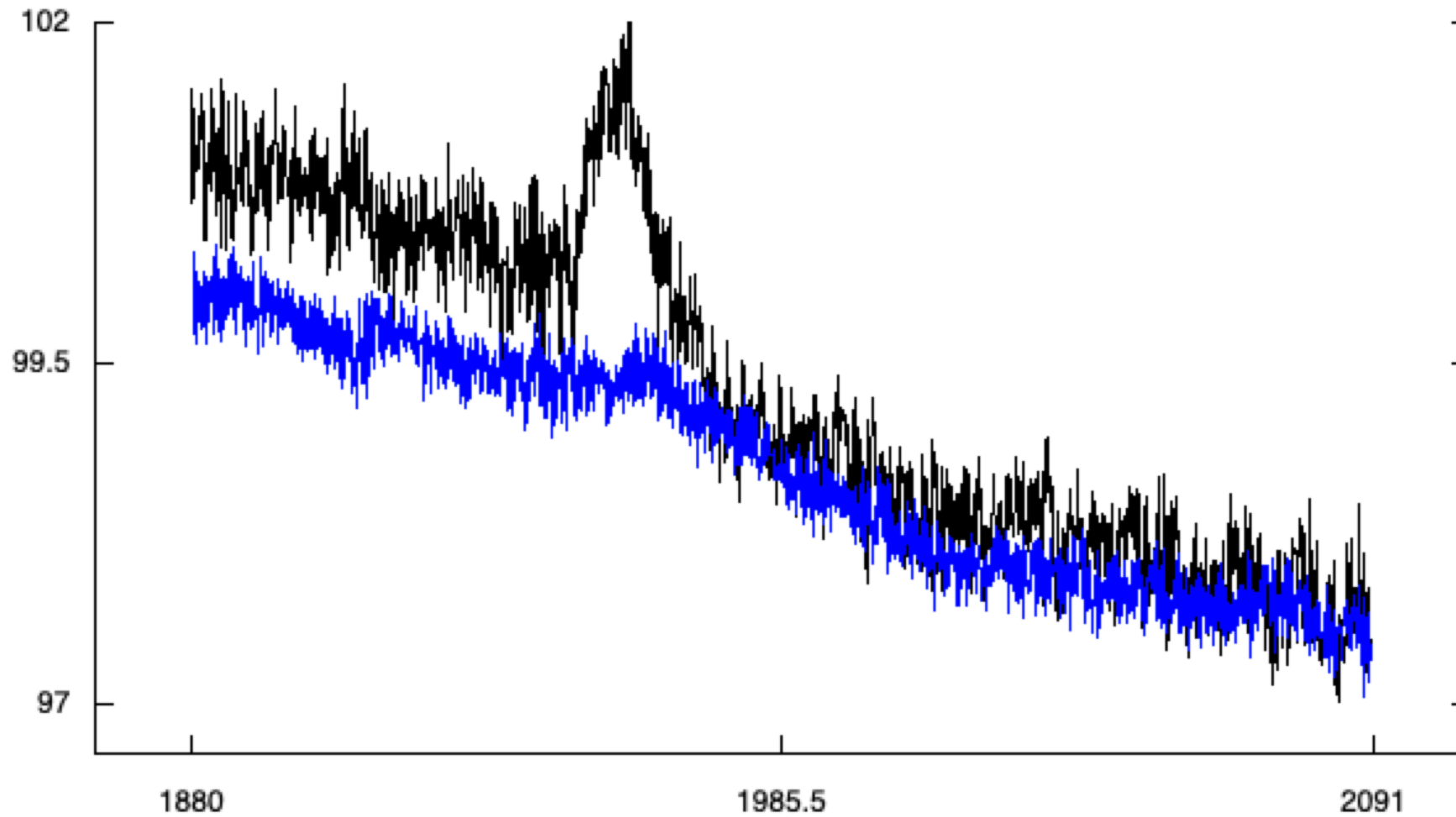
Active Plot: 1. lp\_disp vs mu Plot: Lines Mouse Mode: Line Clear Plot(s)... Clear Annotat

X: 2845.1 (No Match) Y: 0.8278 (No Match) Row Number: None PLOT ROWS: 2812662 to 2823123  
Last Line: x1,y1:(1796.643188, 0.824268), x2,y2:(2039.412598, 0.811605) slope: -5.21604e-05, int.: 0.917982



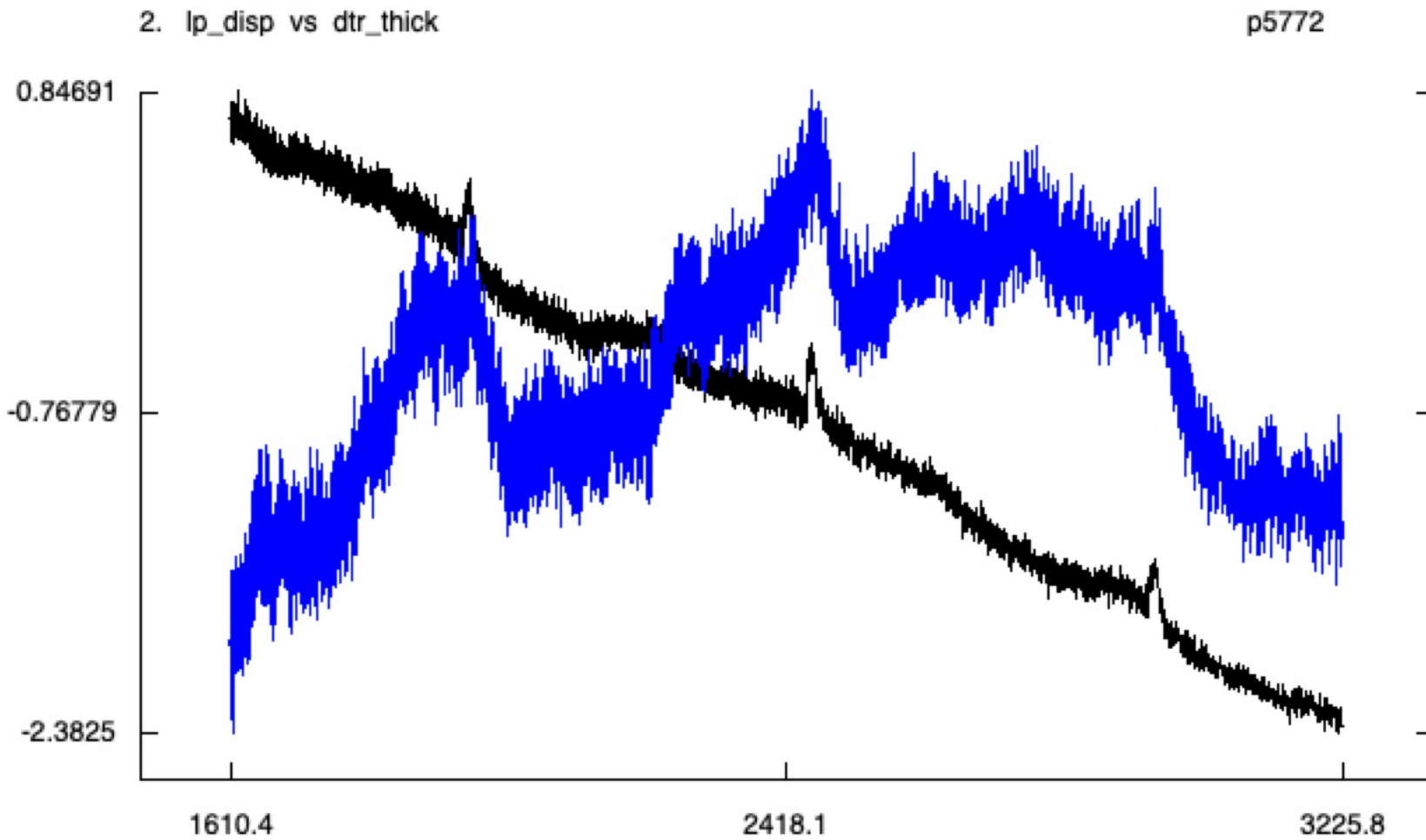
2. lp\_disp vs faultThick

p5772



10 to 30 step showing friction (blk) and internal horizontal disp. I set it to an arbitrary value. Overall trend of fault thickness is compaction but note break in slope showing dilation upon the v step

Plot window 2  
xlook version 2.1  
Active Plot: 2. lp\_disp vs dtr\_thick Plot: Lines Mouse Mode: Zoom New Window Clear Plot(s)... Clear Annot  
X: 3458.5 (No Match) Y: 1.233 (No Match) Row Number: None PLOT ROWS: 2810816 to 282526



Detail of friction (blk) and internal horizontal disp for three v. steps  
I set fault thick. to an arbitrary value. I detrended the fault thickness curve here, overall, and in the next slide for just one step.  
Note that changes in fault thickness occur over about the distance of friction  $D_c$

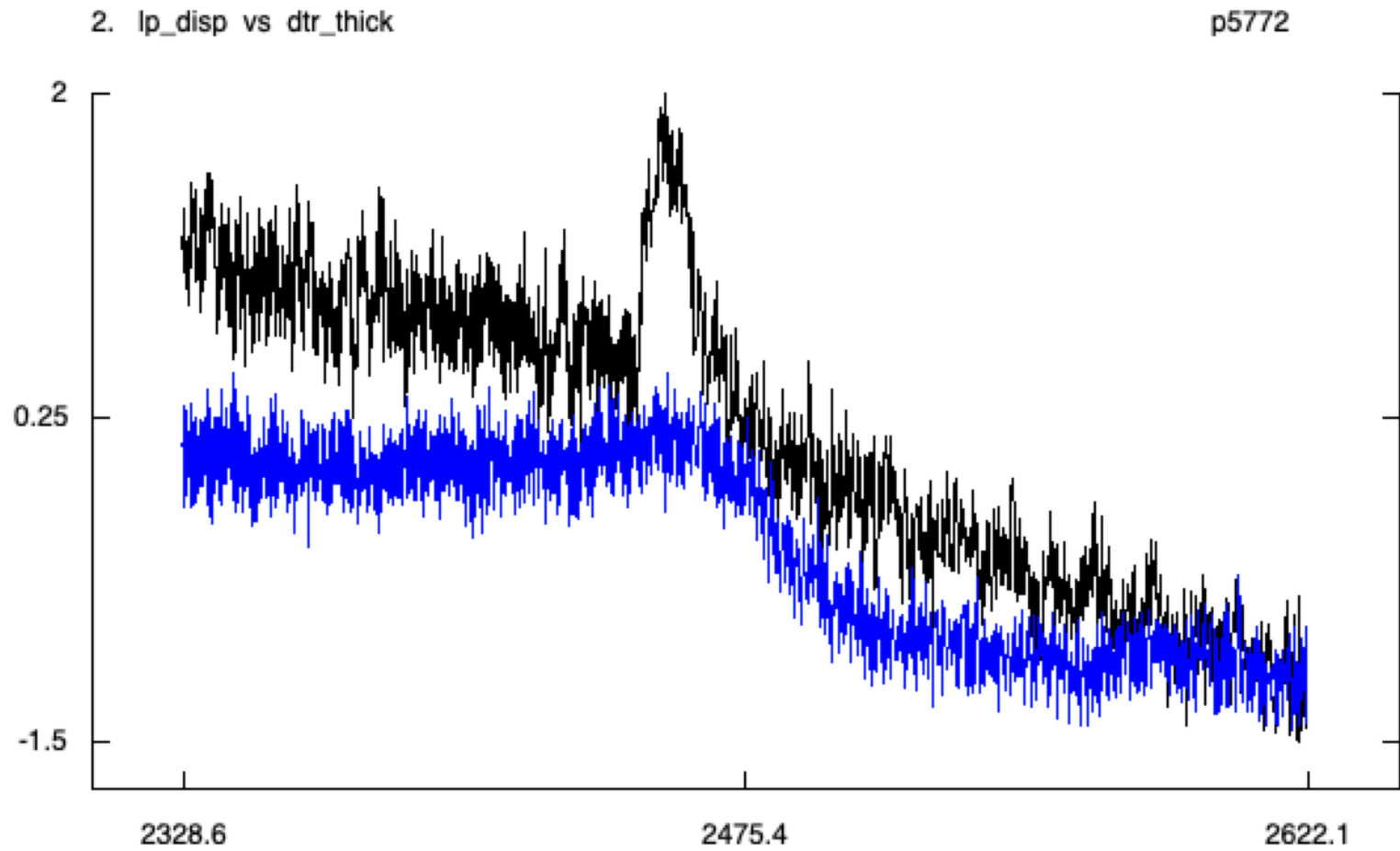
Plot Window 1

xlook version 2.1

Active Plot: 2. lp\_disp vs dtr\_thick Plot: Lines Mouse Mode: Line Clear Plot(s)... Clear Annotations

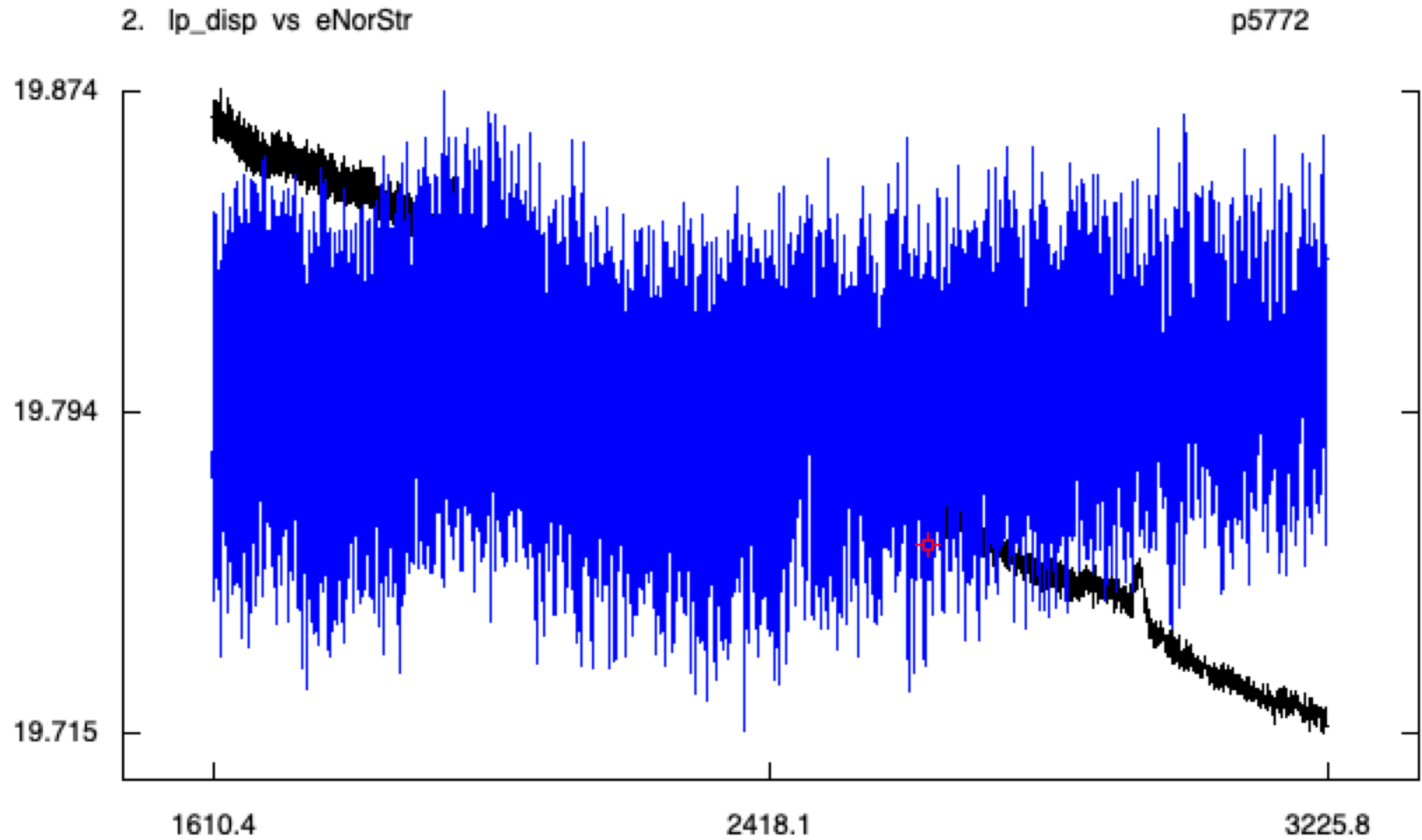
X: 2231.8 (No Match) Y: -2.2935 (No Match) Row Number: None PLOT ROWS: 2819518 to 2822033

Last Line: x1,y1:(2332.877686, 6162.474121), x2,y2:(2623.890625, 6160.795410) slope: -0.00576851, int.: 6175.93



30 to 100 step showing friction (blk) and internal horizontal disp. I set it to an arbitrary value. I detrended the fault thickness at  $30 \mu\text{m/s}$  Note that relative dilation upon the v step is tiny and then there's compaction of about  $1 \mu\text{m}$  over about the distance of friction  $D_c$

Plot Window 2  
xlook version 2.1  
Active Plot: 2. Ip\_disp vs eNorStr Plot: Lines Mouse Mode: Line Clear Plot(s)... Clear Annotation  
X: 2649.1 (Data: 2649) Y: 19.67 (Data: 19.761) Row Number: 2822228 PLOT ROWS: 2810816 to 2825266



Sanity check to look at normal stress changes during v steps. Left access is effective nor. stress in MPa

The changes are within the noise.

R/S Fric Tool

law/options	r	disp_col	1	mu_col	12
mu_fit_col	9	first_row	2814493	vs_row	2815410
last_row	2816982	weight_row	2815511	lin_term	-5.31439e-05
c_tol	1e-3	lambda	-0.1	wc	0
stiff	0.003	v_initial	10	v_final	30
mu_initial	0.814	a	0.01	b1	0.013
dc1	13				

Model:  Forward  Inversion

1 State Variable  2 State Variable

Normal Weighting  Alternative Weighting

Single Velocity Step  Multiple Velocity Step

rsf model fits quite well.

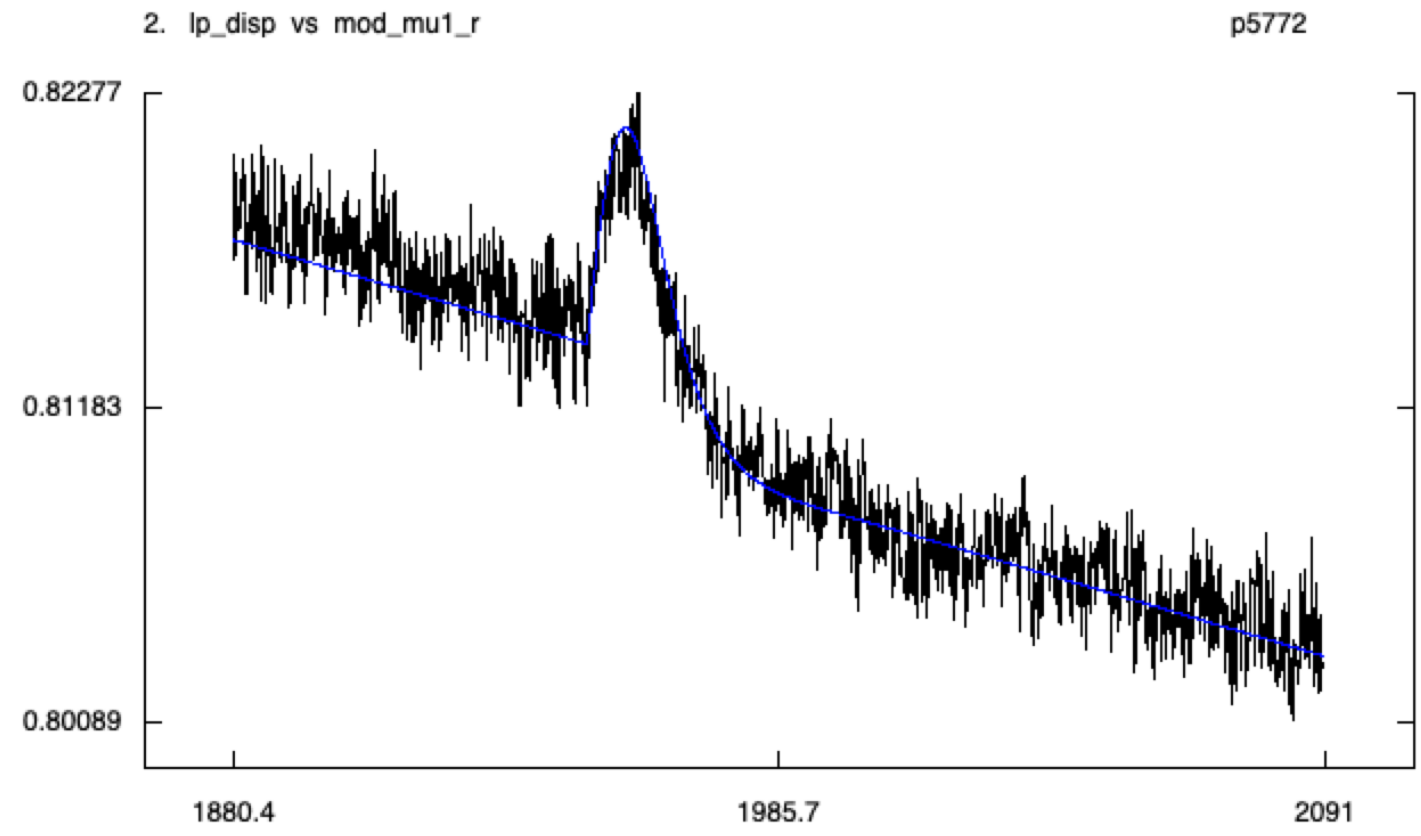
Plot Window 3

xlook version 2.1

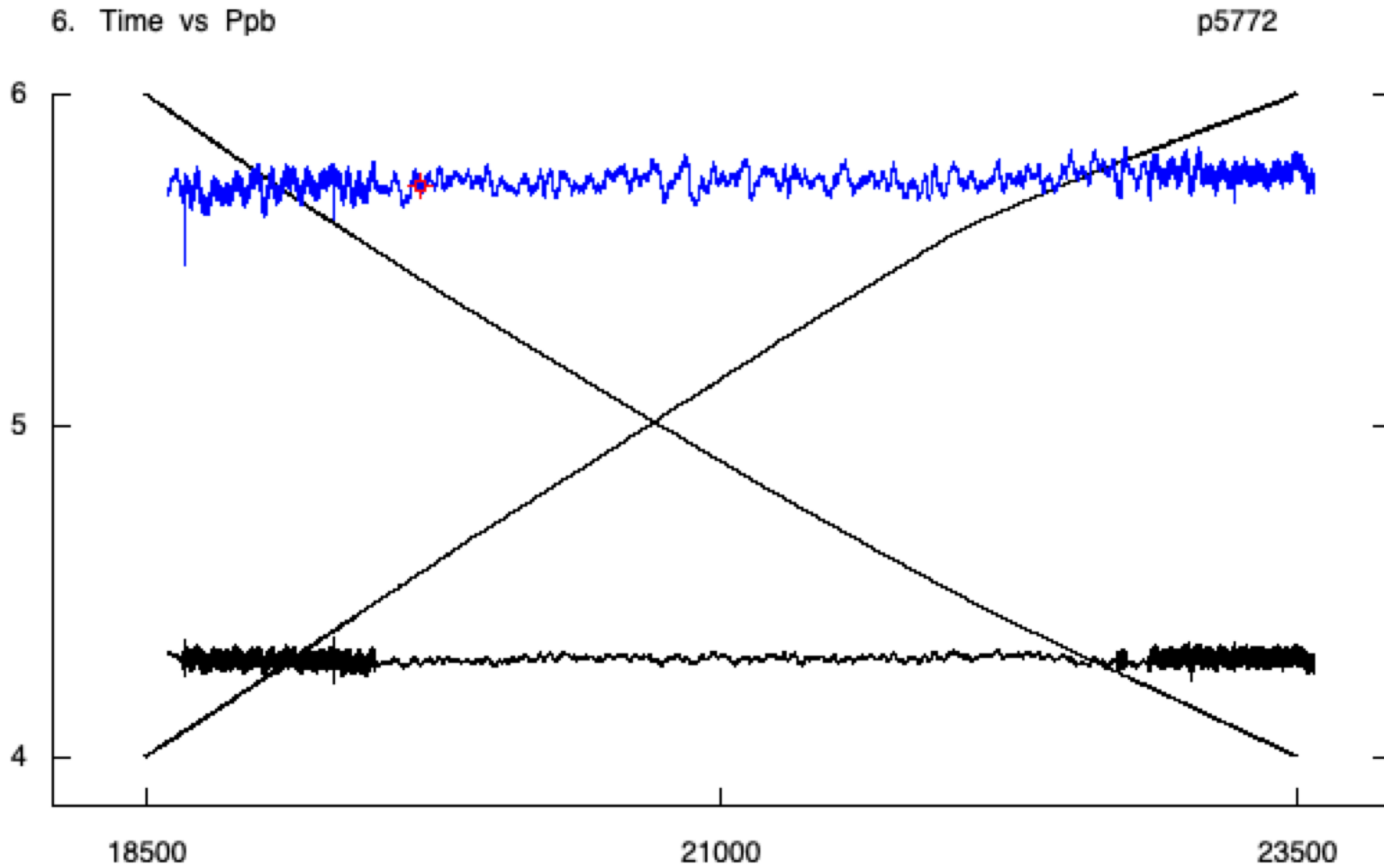
Active Plot: 2. lp\_disp vs mod\_mu1\_r Plot: Lines Mouse Mode: Line

X: 1876.9 (No Match) Y: 0.82633 (No Match) Row Number: None PLOT ROWS: 2814493 to 2816982

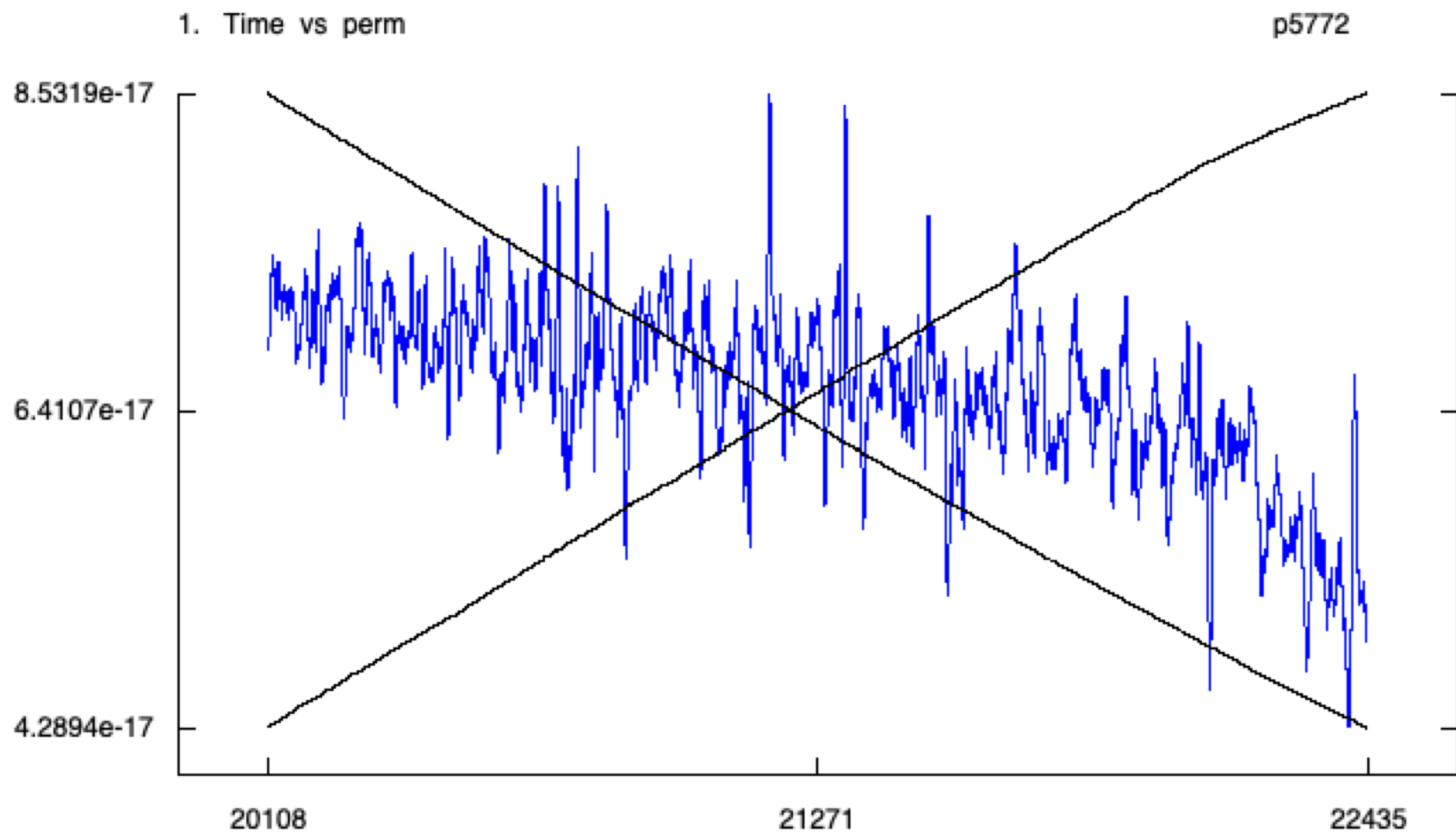
Last Line: x1,y1:(23640.457031, 1958.252319), x2,y2:(23644.396484, 2078.014404) slope: 30.4007, int.: -716728



6. Time vs Ppb



Section where we measured perm.  
Horizontal lines are Ppb and Ppa  
Linear trends are flow rate from a and b



Darcy perm. in blue,  
 $k = 6e-17 \text{ m}^2$

Linear trends are  
flow rate from a and  
b

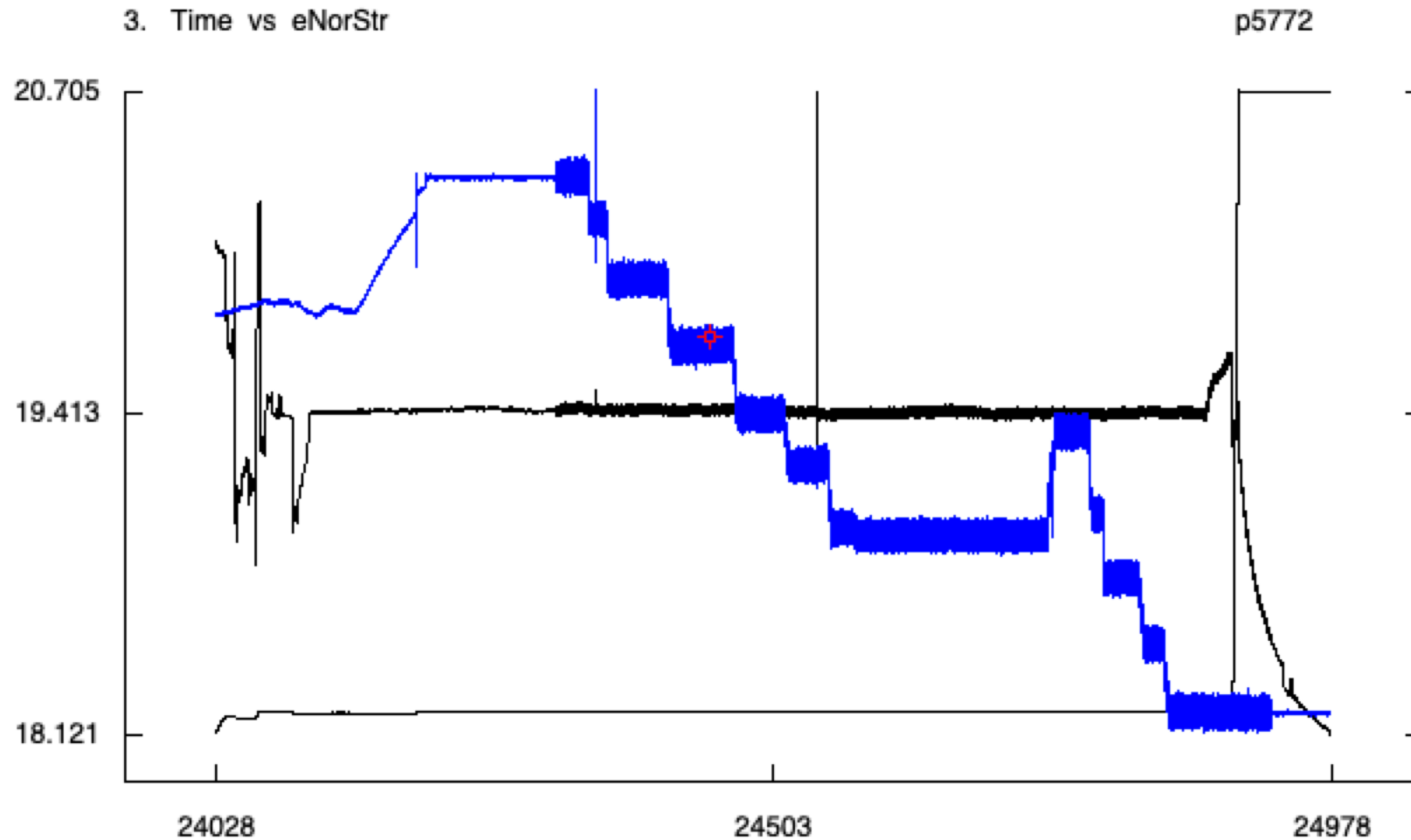


Plot Window 2

xlook version 2.1

Active Plot: 3. Time vs eNorStr Plot: Lines Mouse Mode: Line Clear Plot(s)... Clear Annotations

X: 24449 (Data: 24449) Y: 21.107 (Data: 19.717) Row Number: 3325582 PLOT ROWS: 3192806 to 3804224



Creep section  
Shear stress was  
servo feedback.

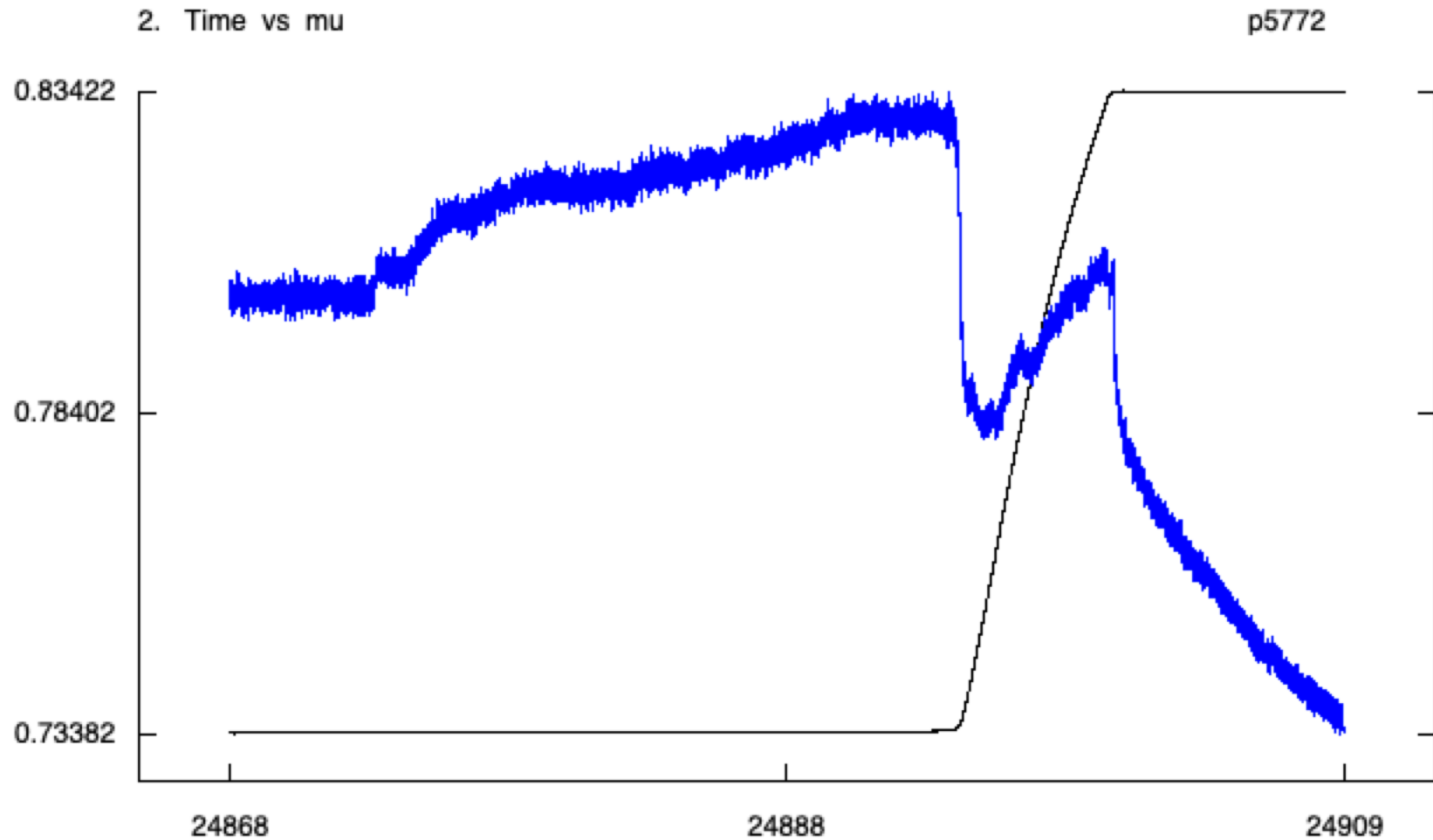
Black is shear stress  
Blue is eff. Nor  
Stress.  
We kept reducing  
eNorstrss but didn't  
see much

Lower horz. Line is  
fault shear disp.  
Near the end we  
increased shear  
stress and got a  
runaway instability

xlook version 2.1

Active Plot: 2. Time vs mu Plot: Lines Mouse Mode: Zoom and Clear Clear Plot(s)... Clear Annotation

X: 24922 (No Match) Y: 0.79093 (No Match) Row Number: None PLOT ROWS: 3744335 to 3785731



Detail of the shear instability –note stress drop when slip begins even though we're in servo load feedback.