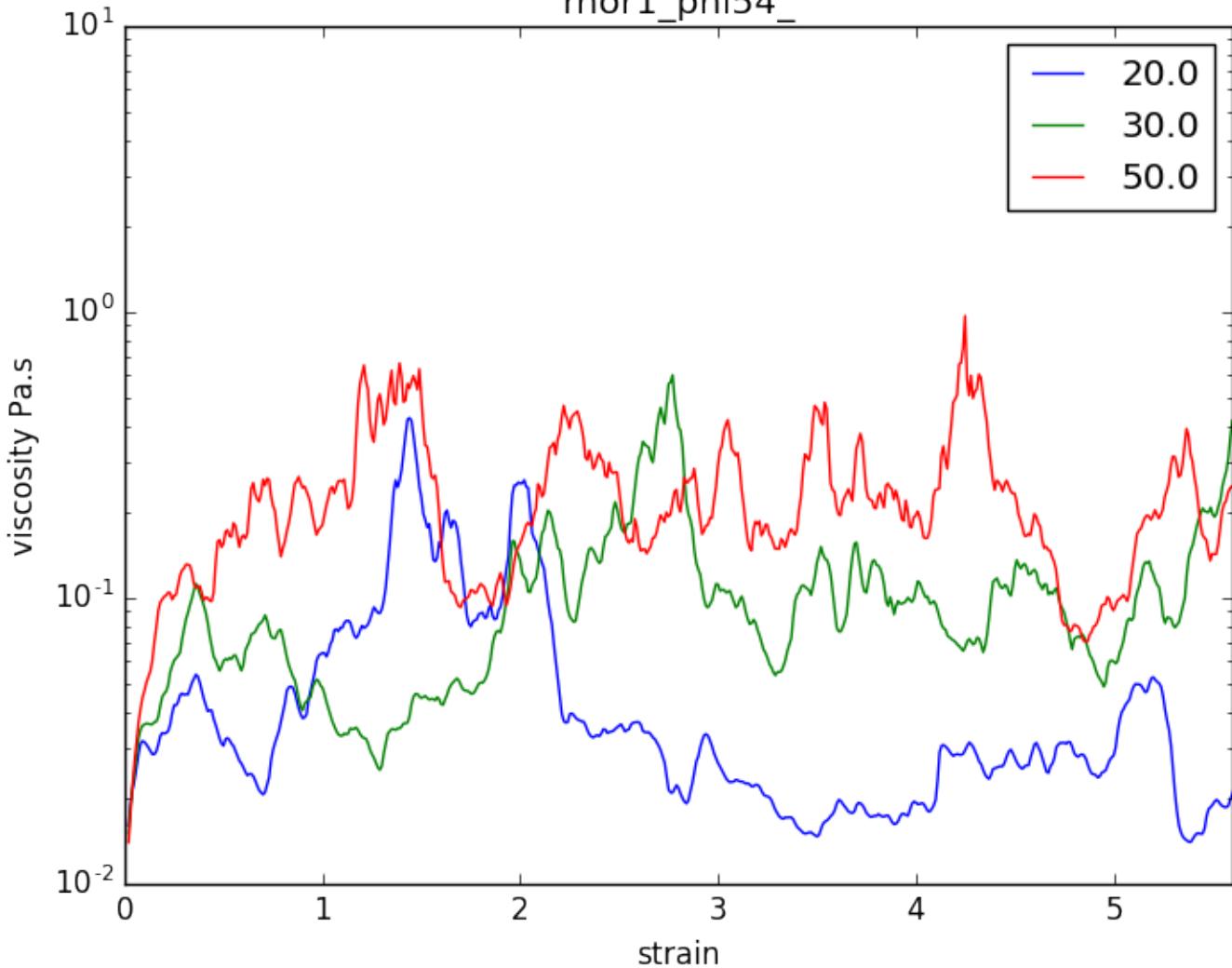
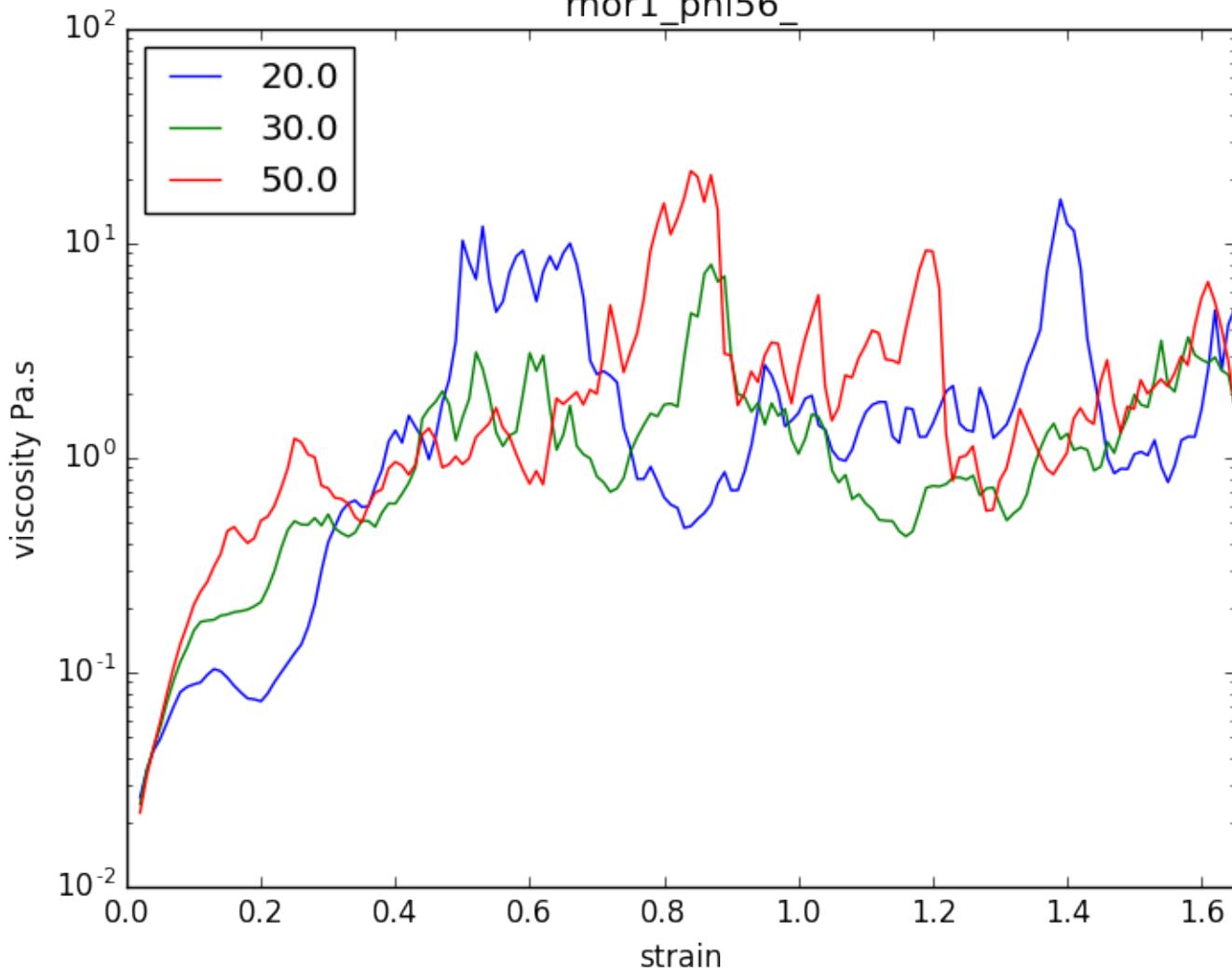


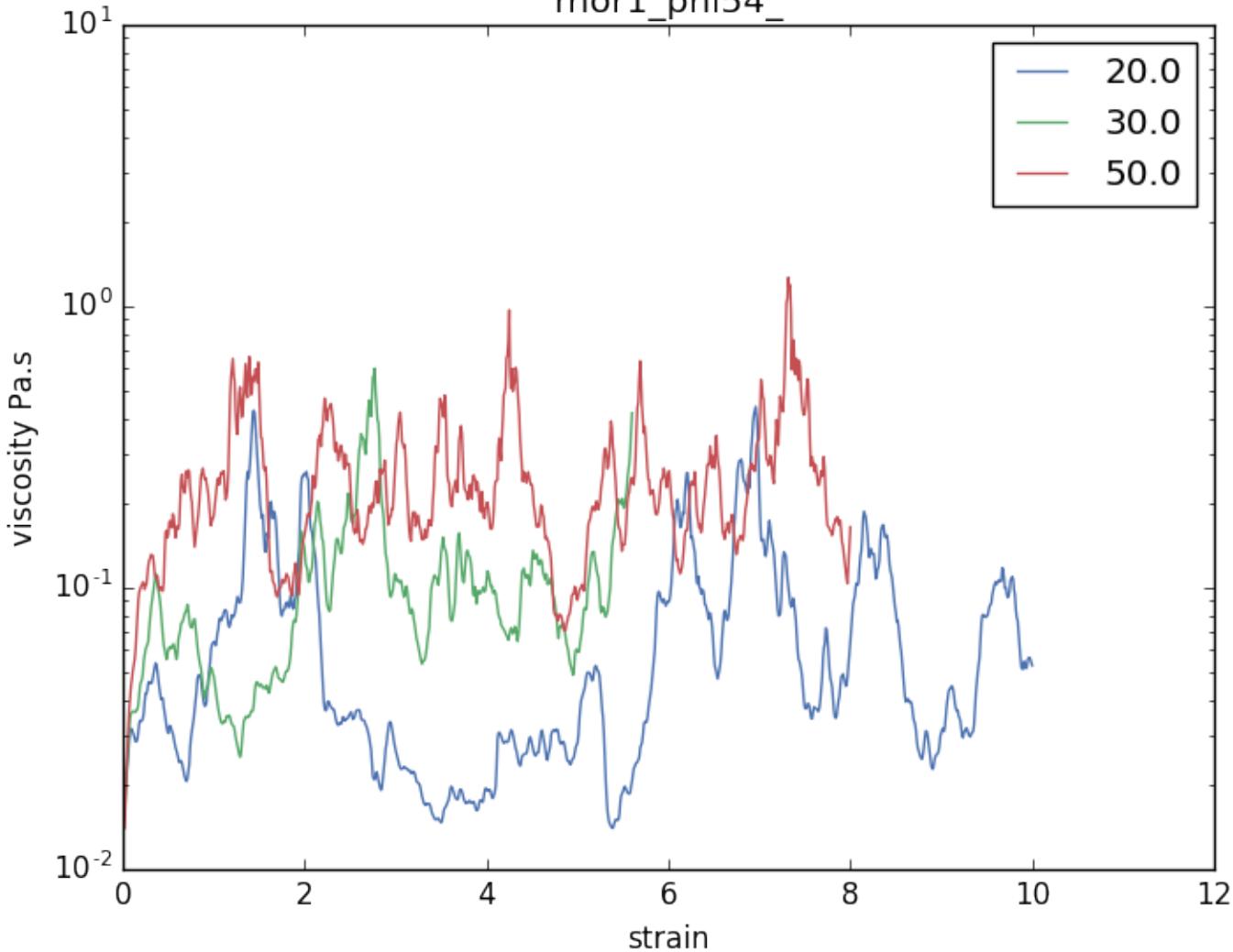
rhor1\_phi54\_



rhor1\_phi56

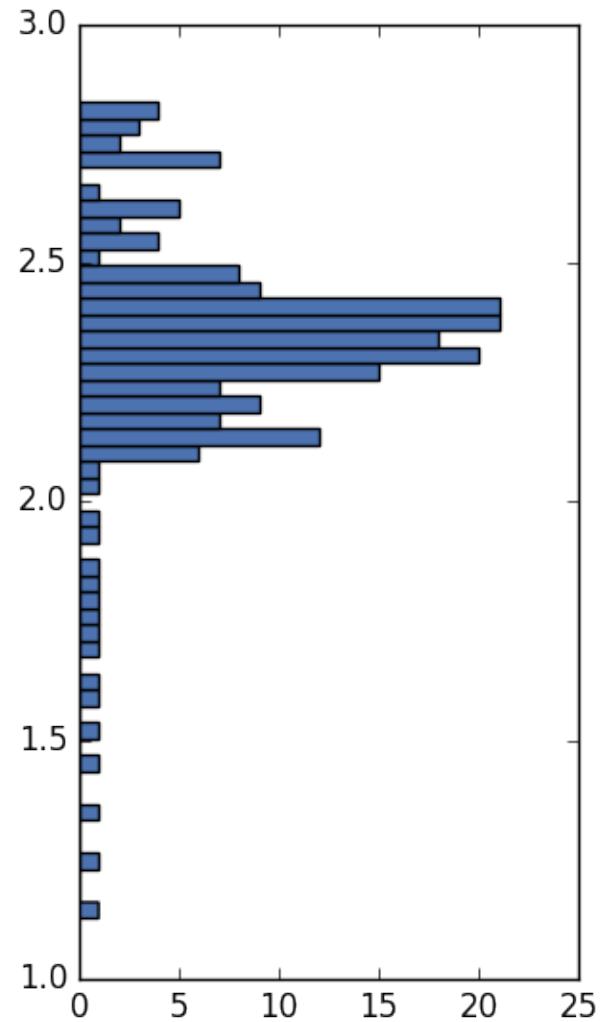
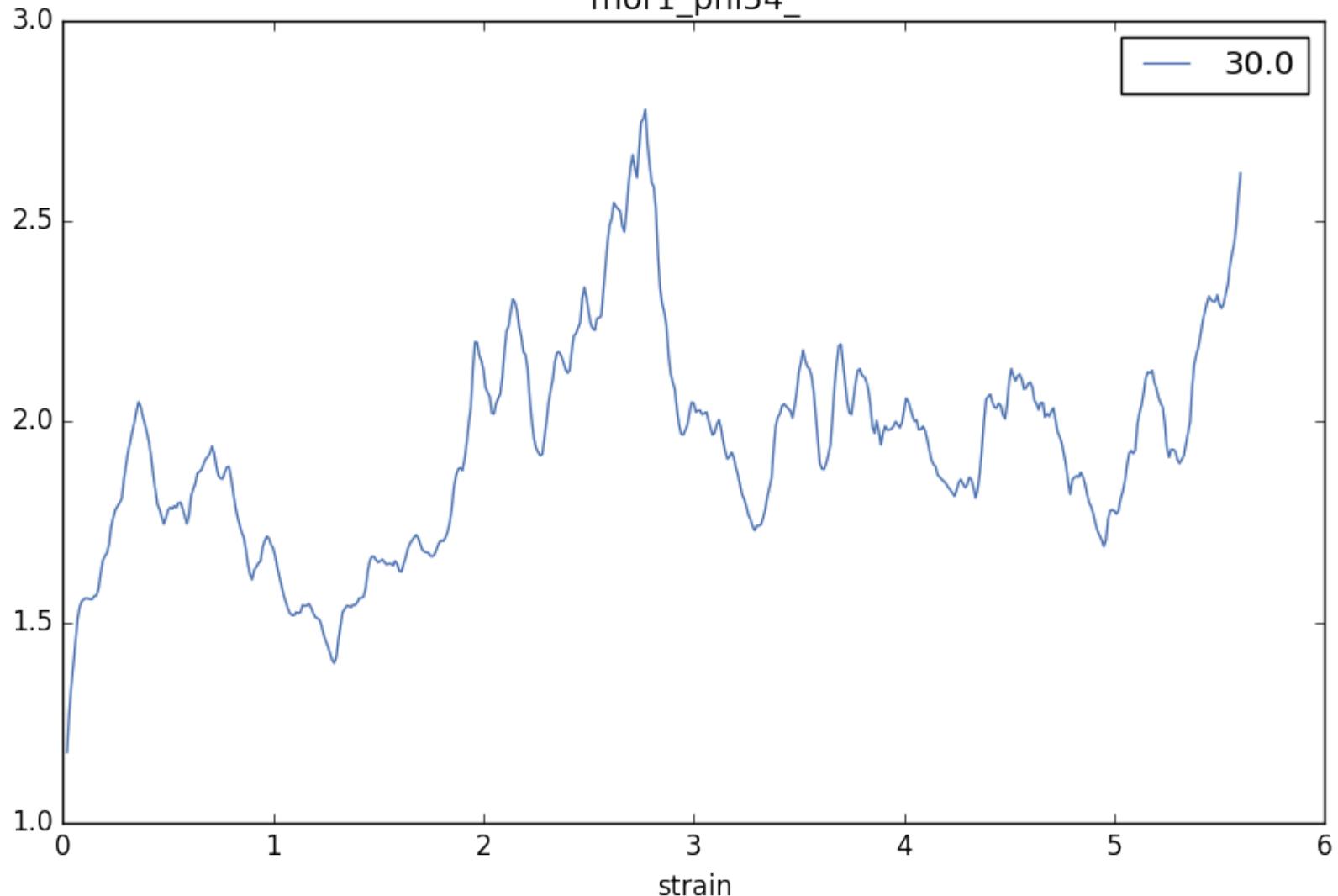


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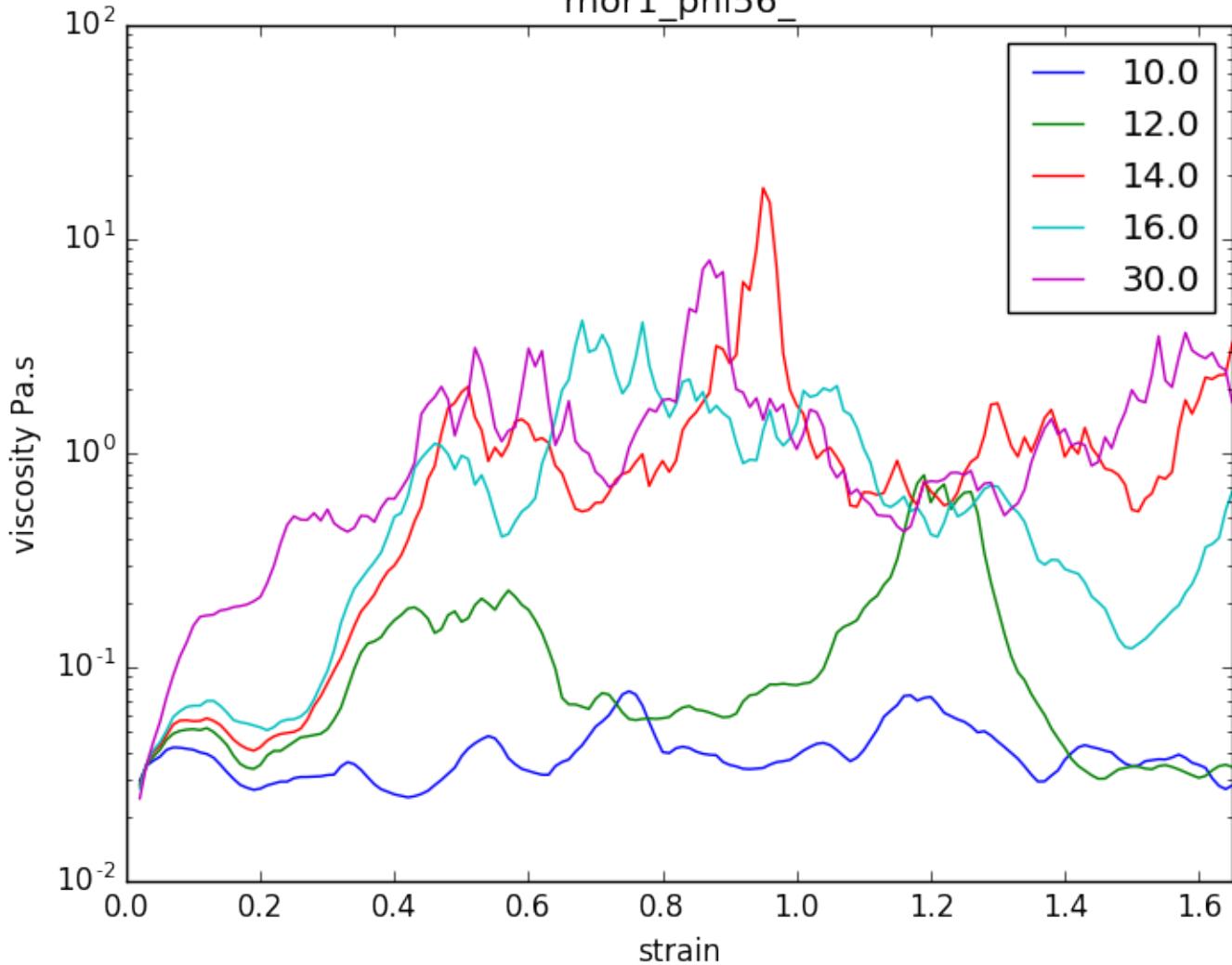


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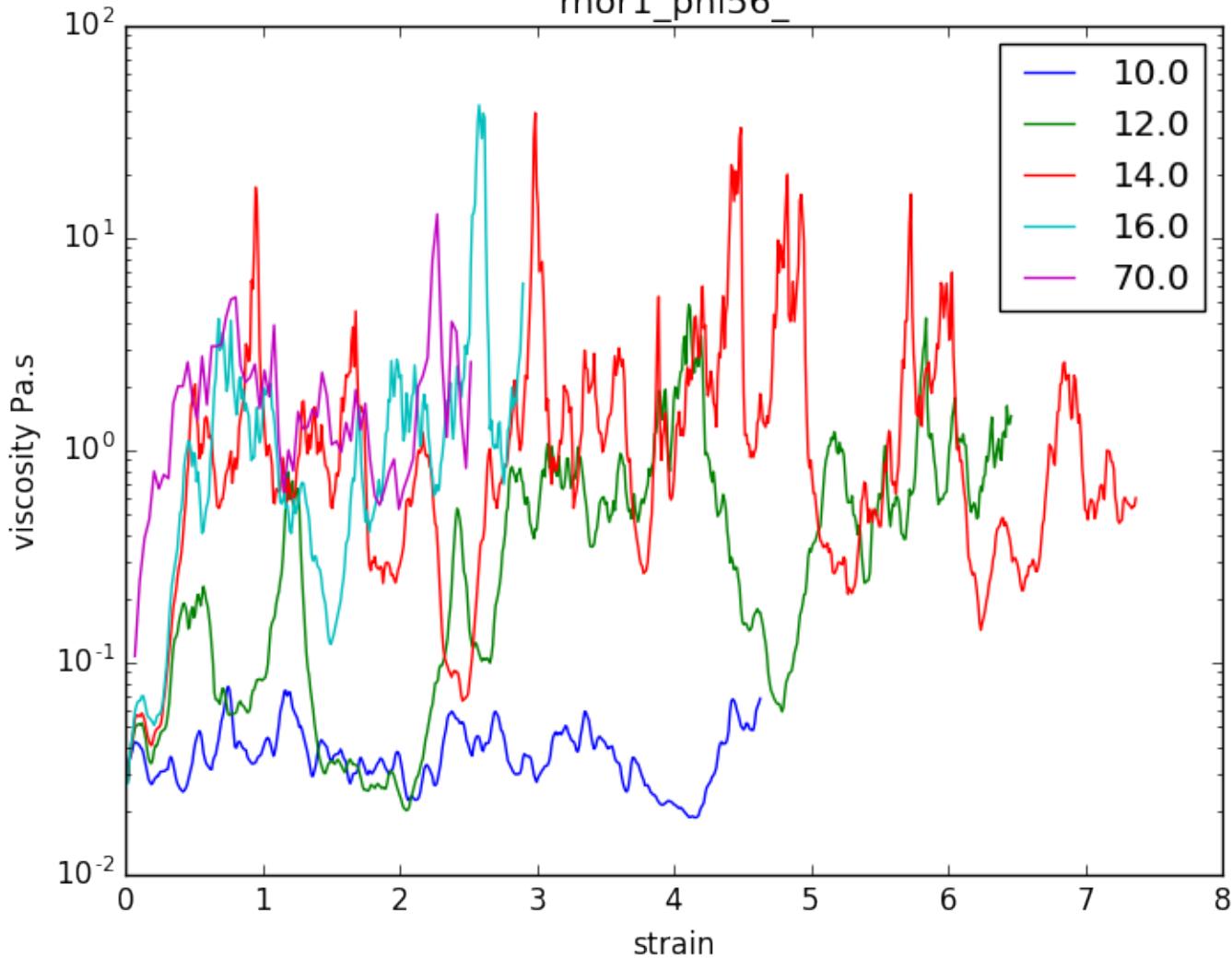
Relative viscosity Pa.s



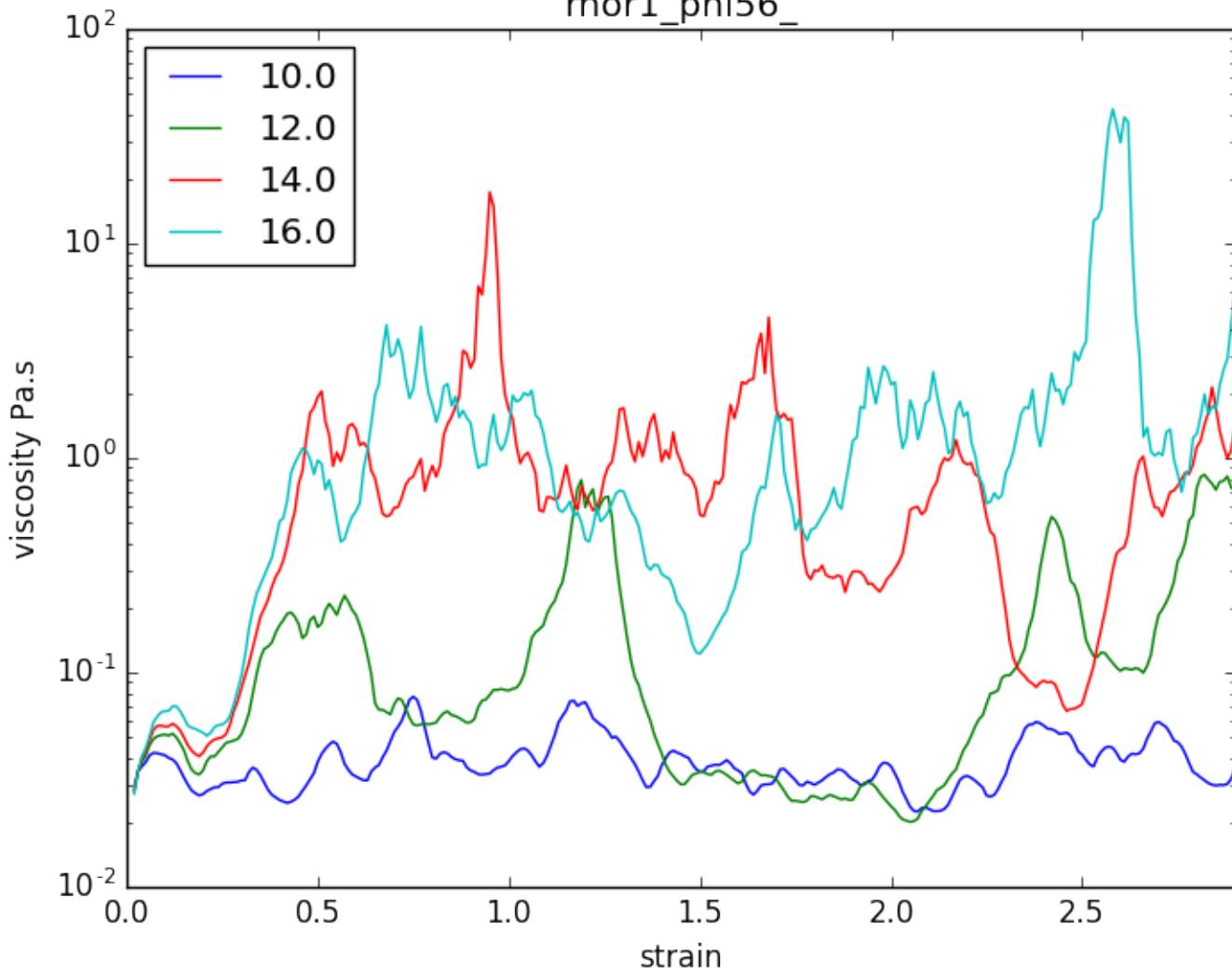
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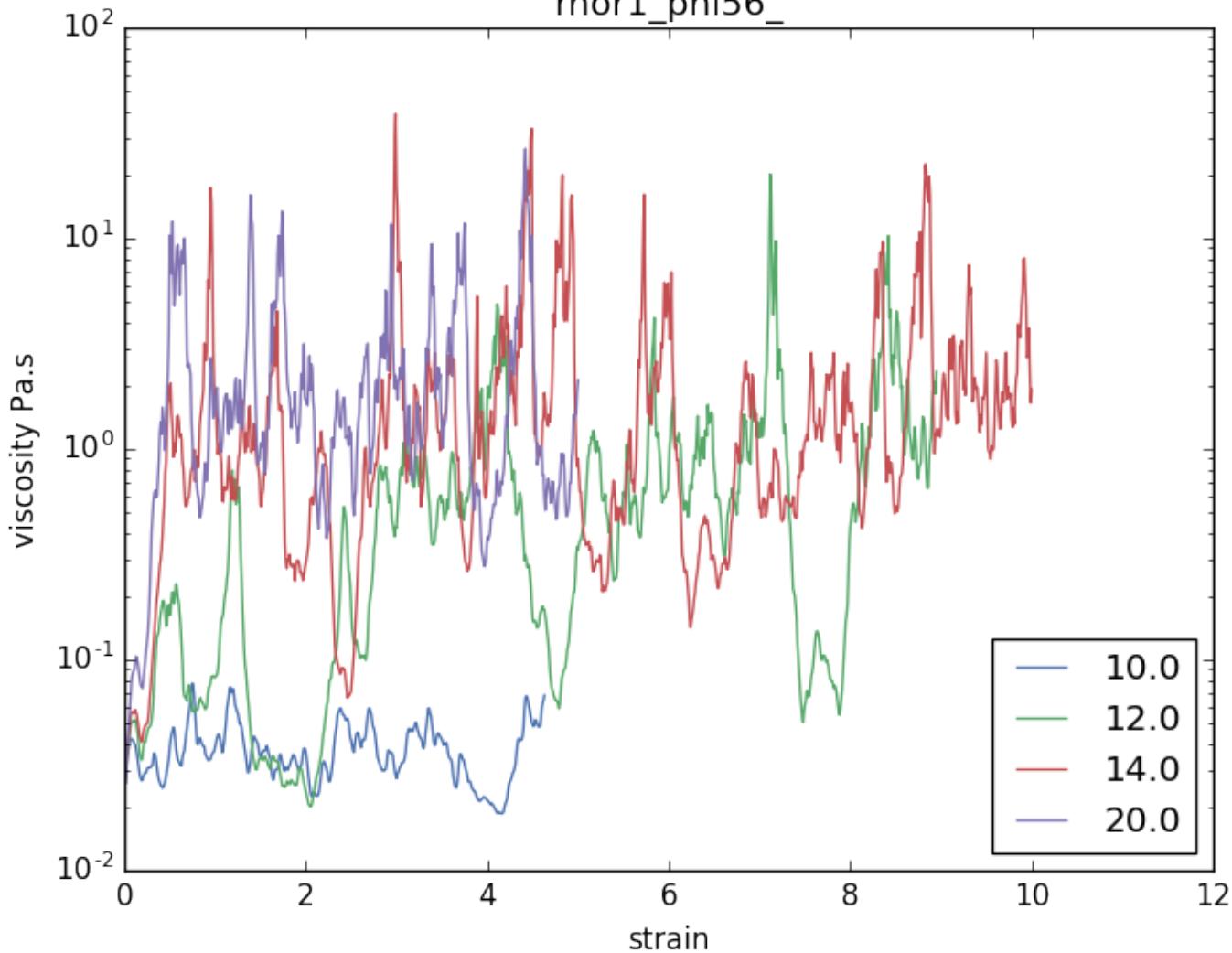
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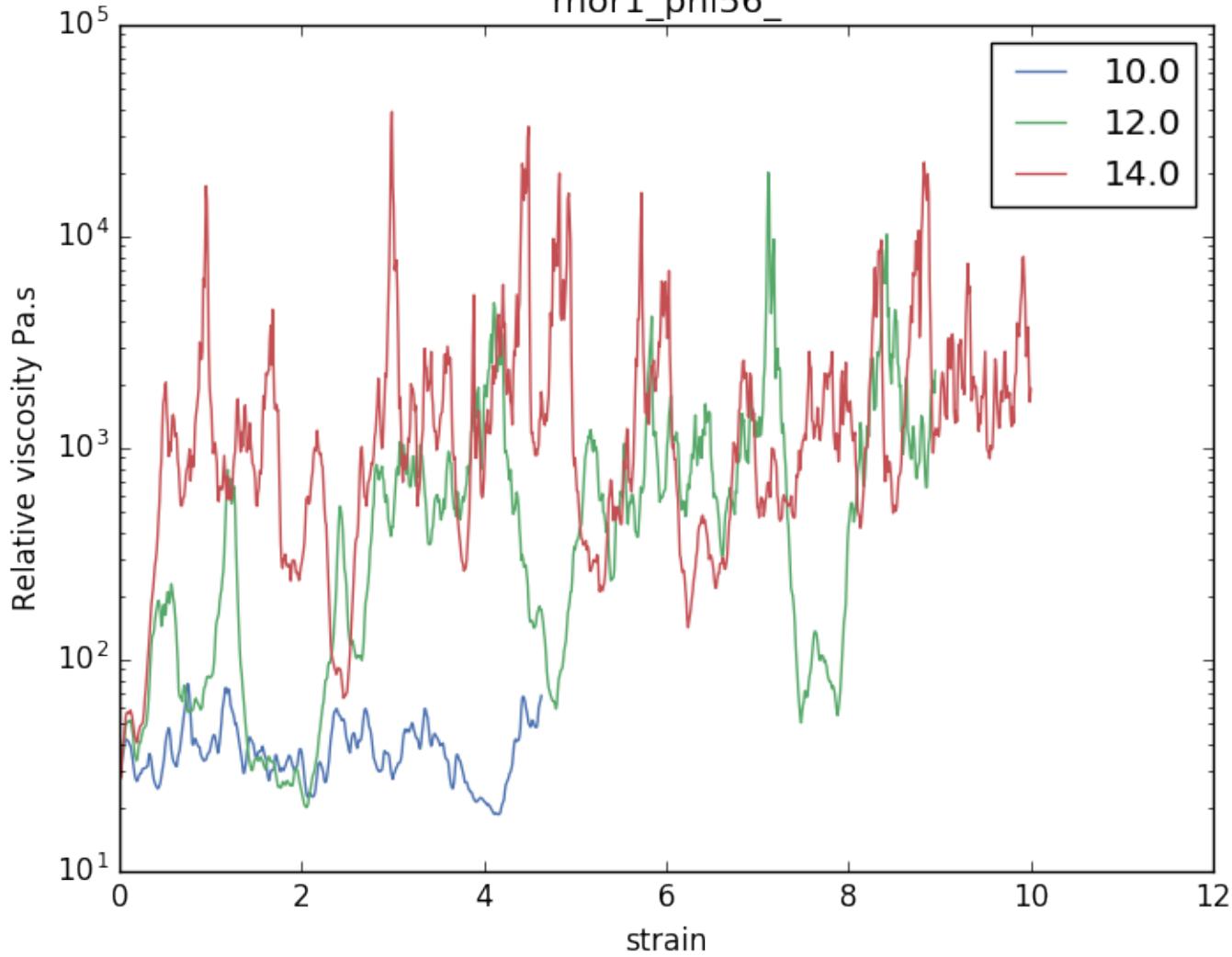
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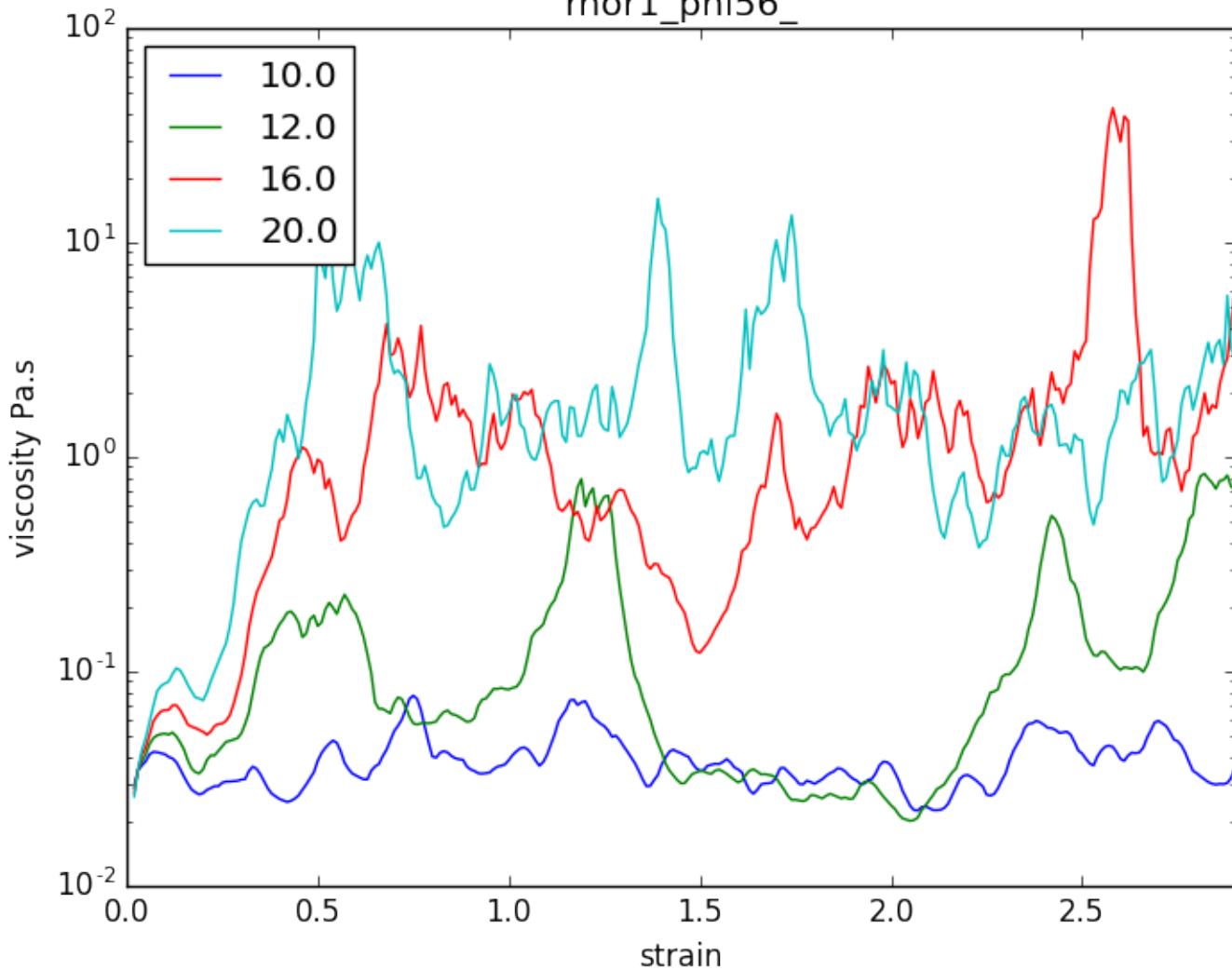
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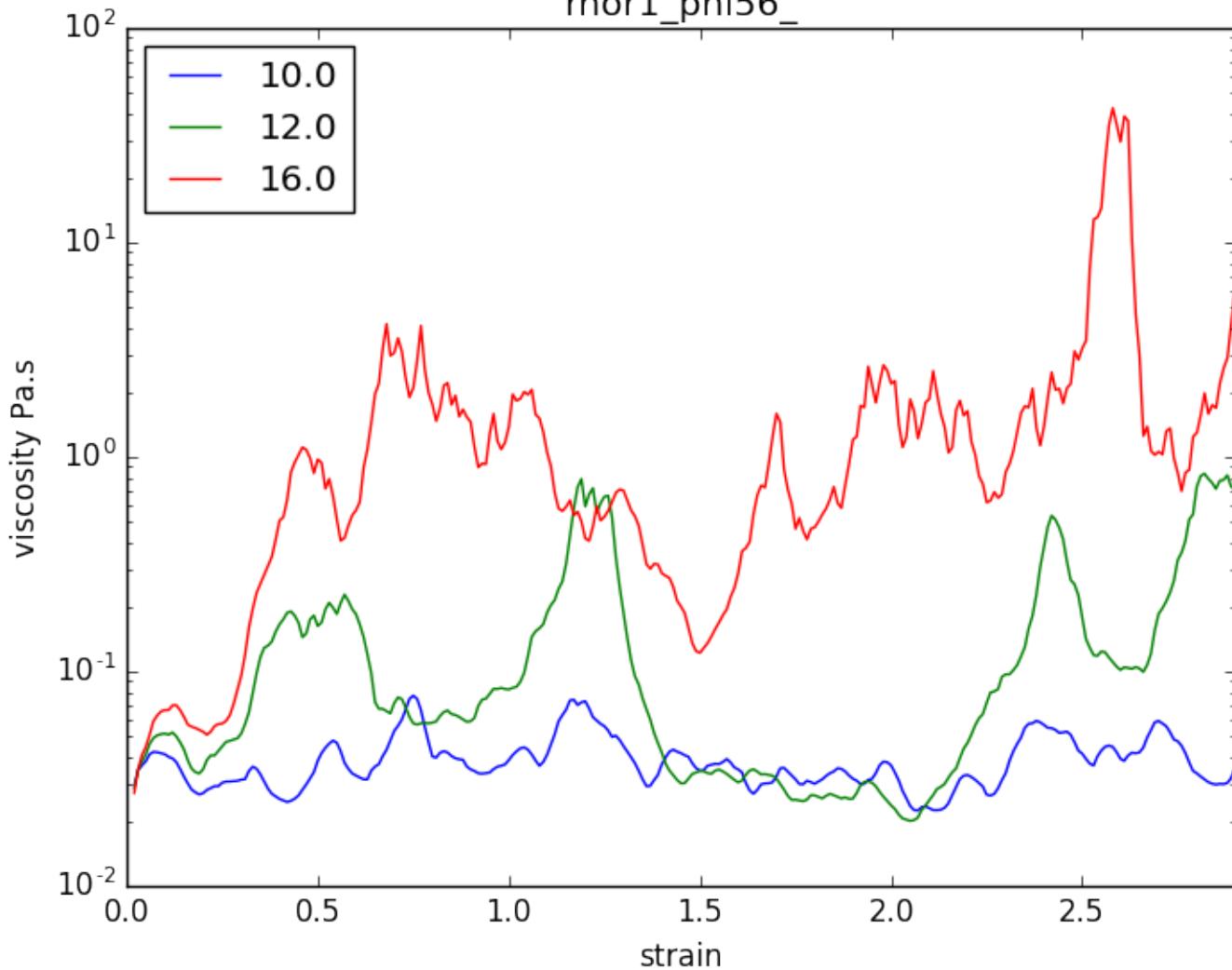
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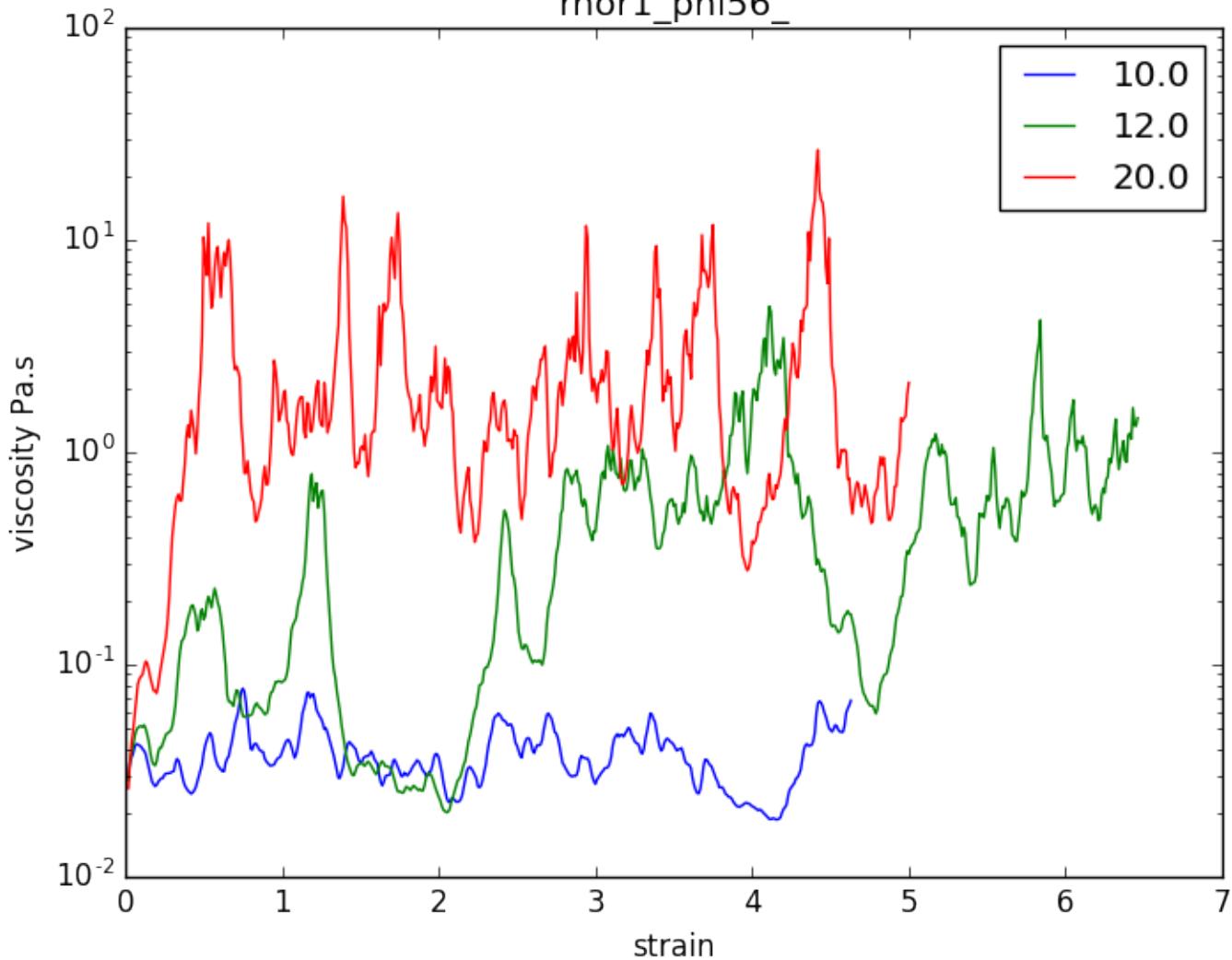
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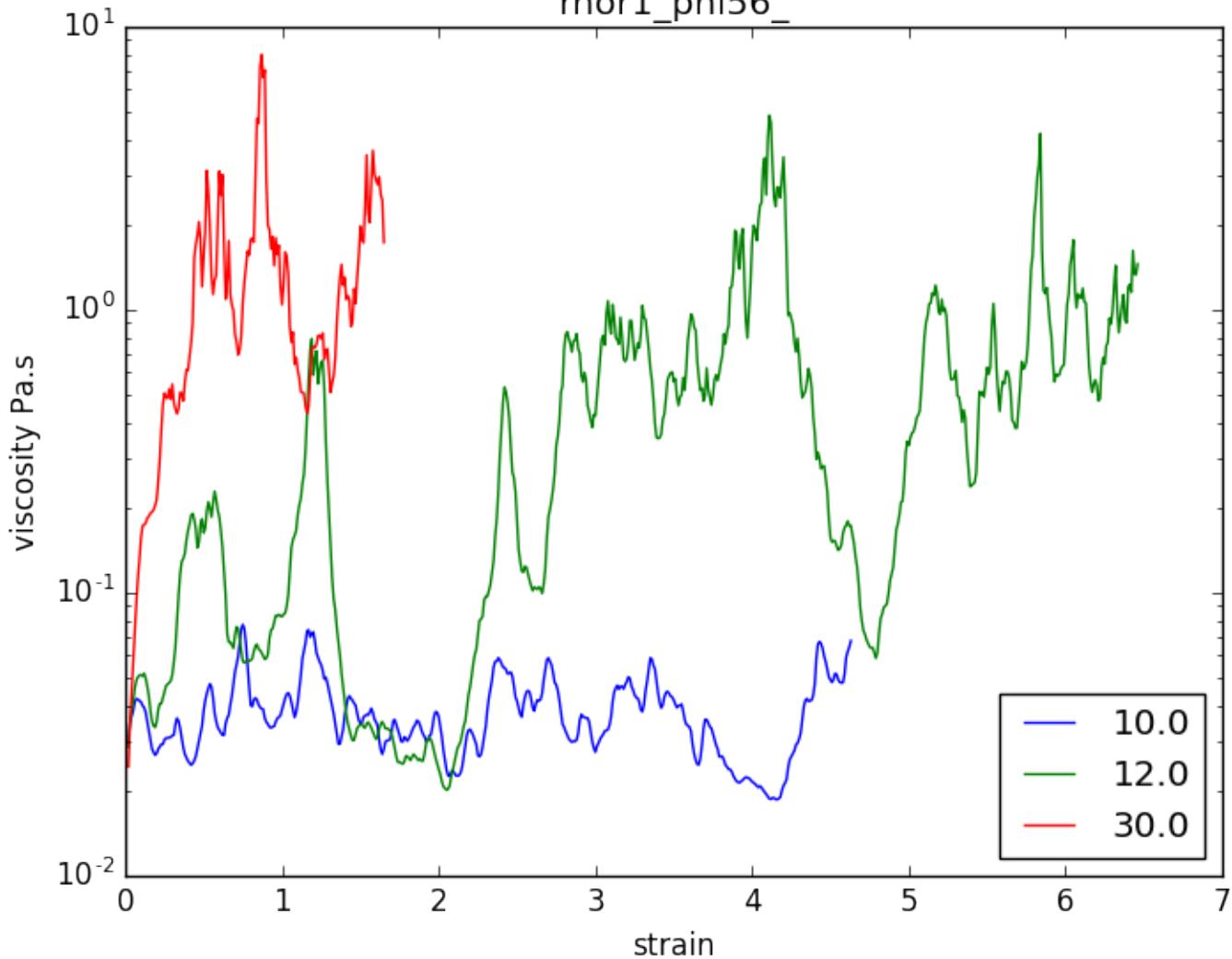
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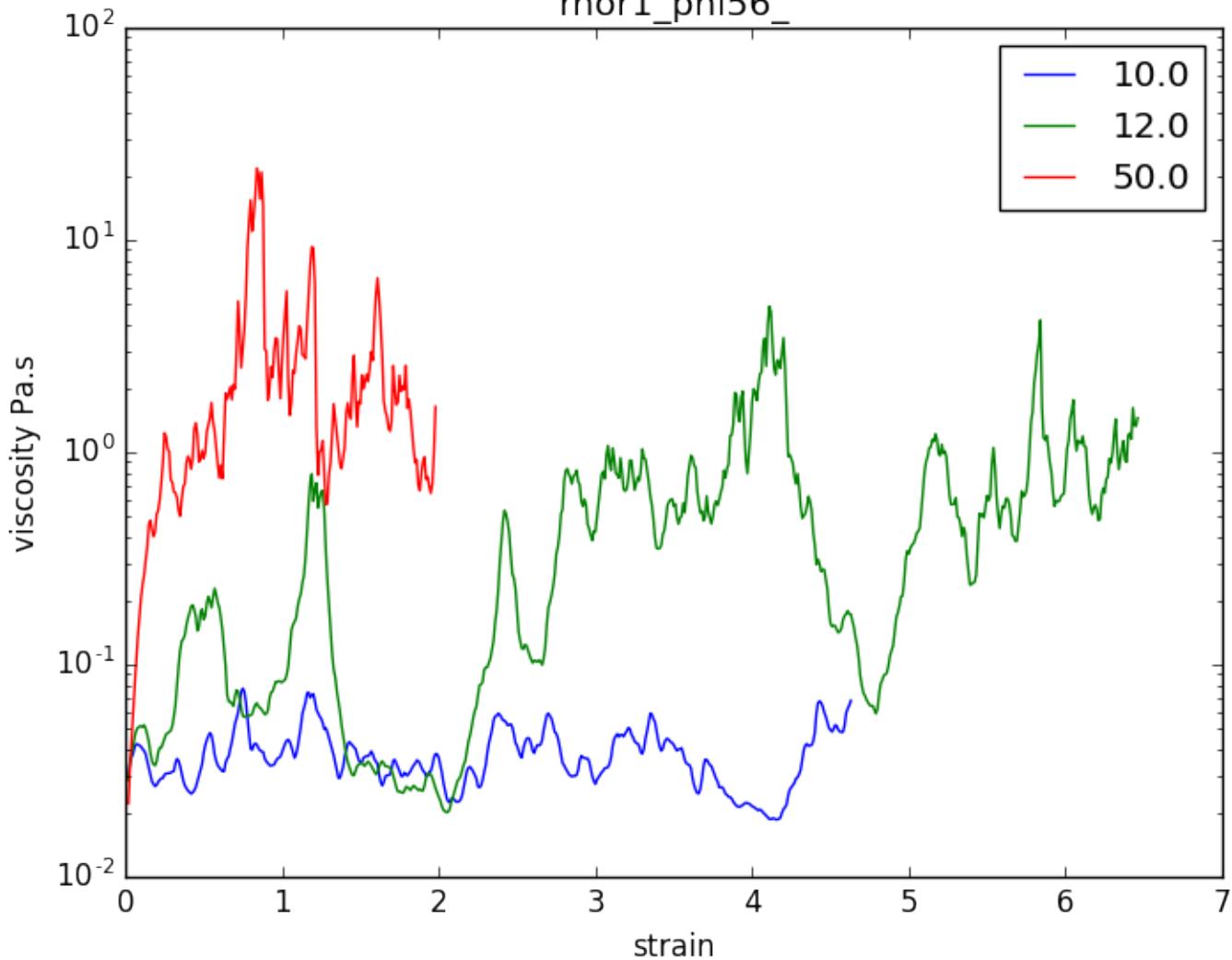
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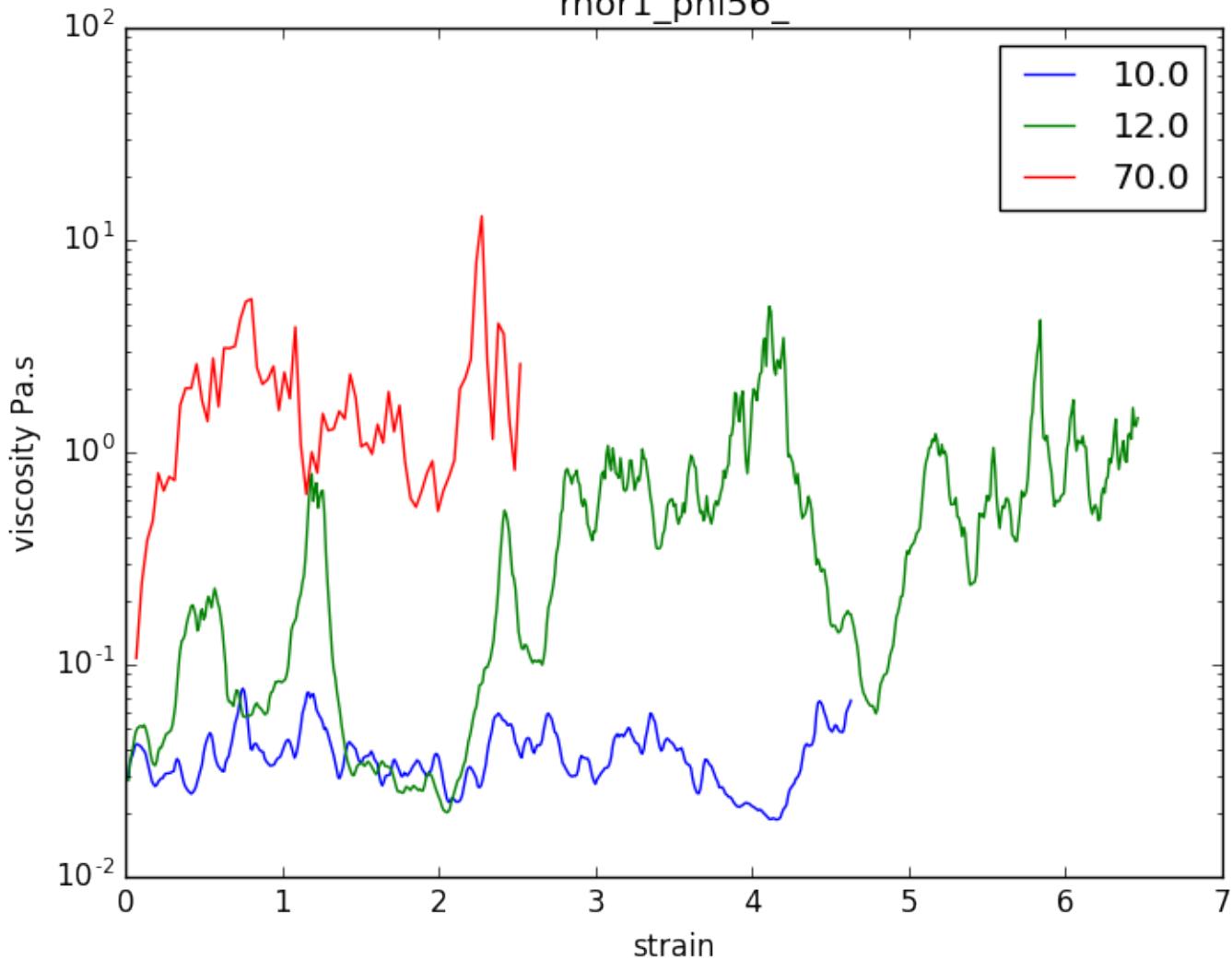
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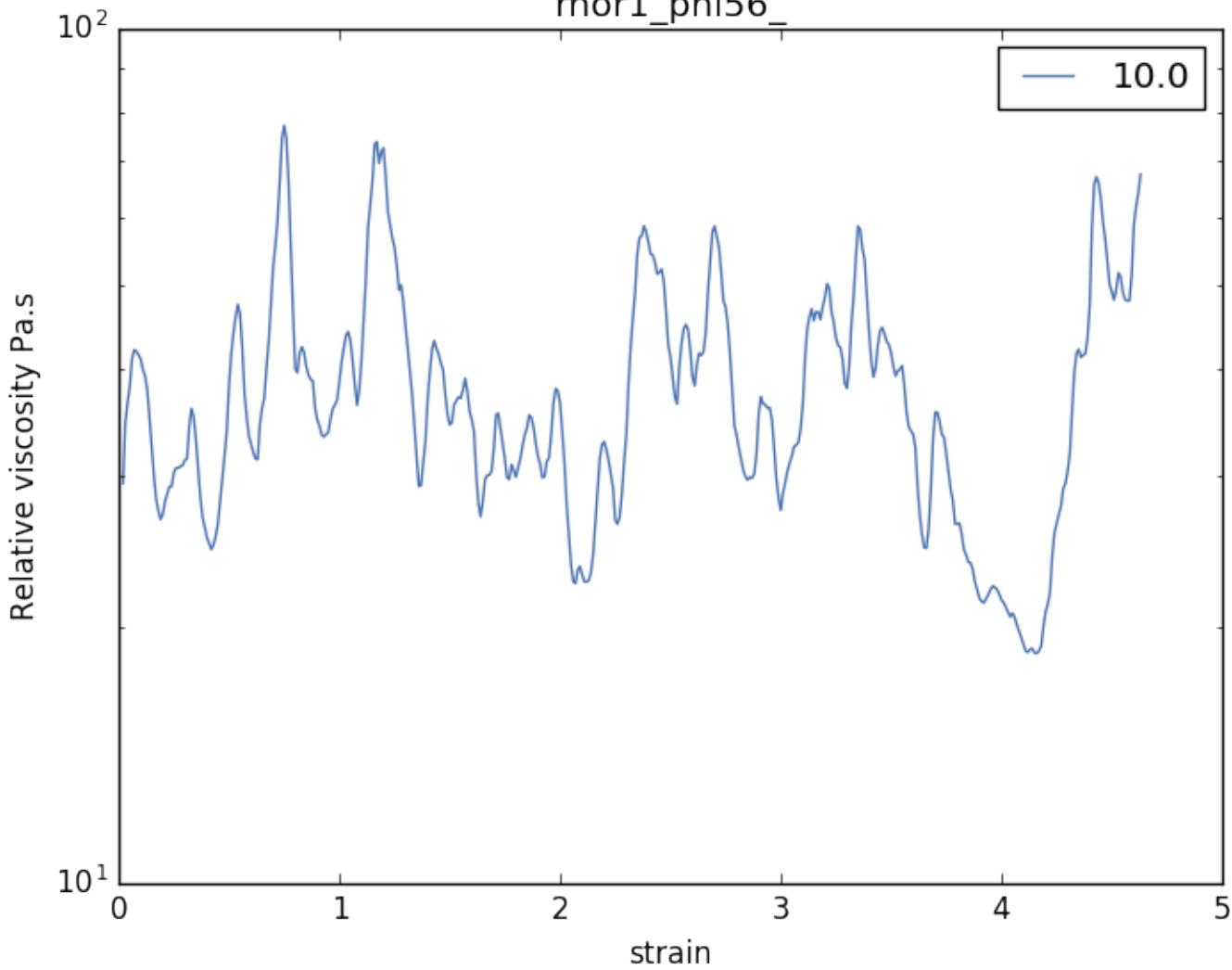
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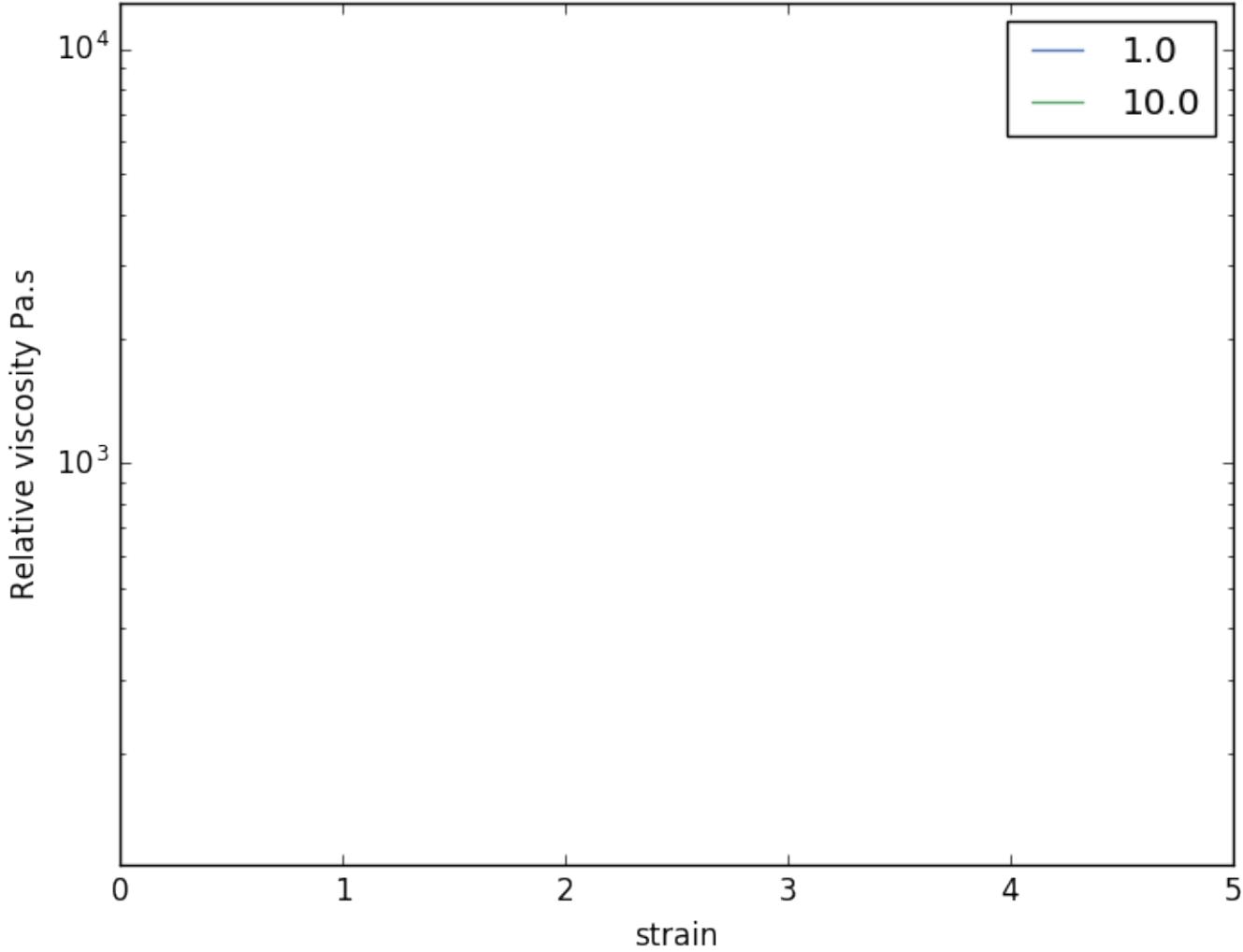
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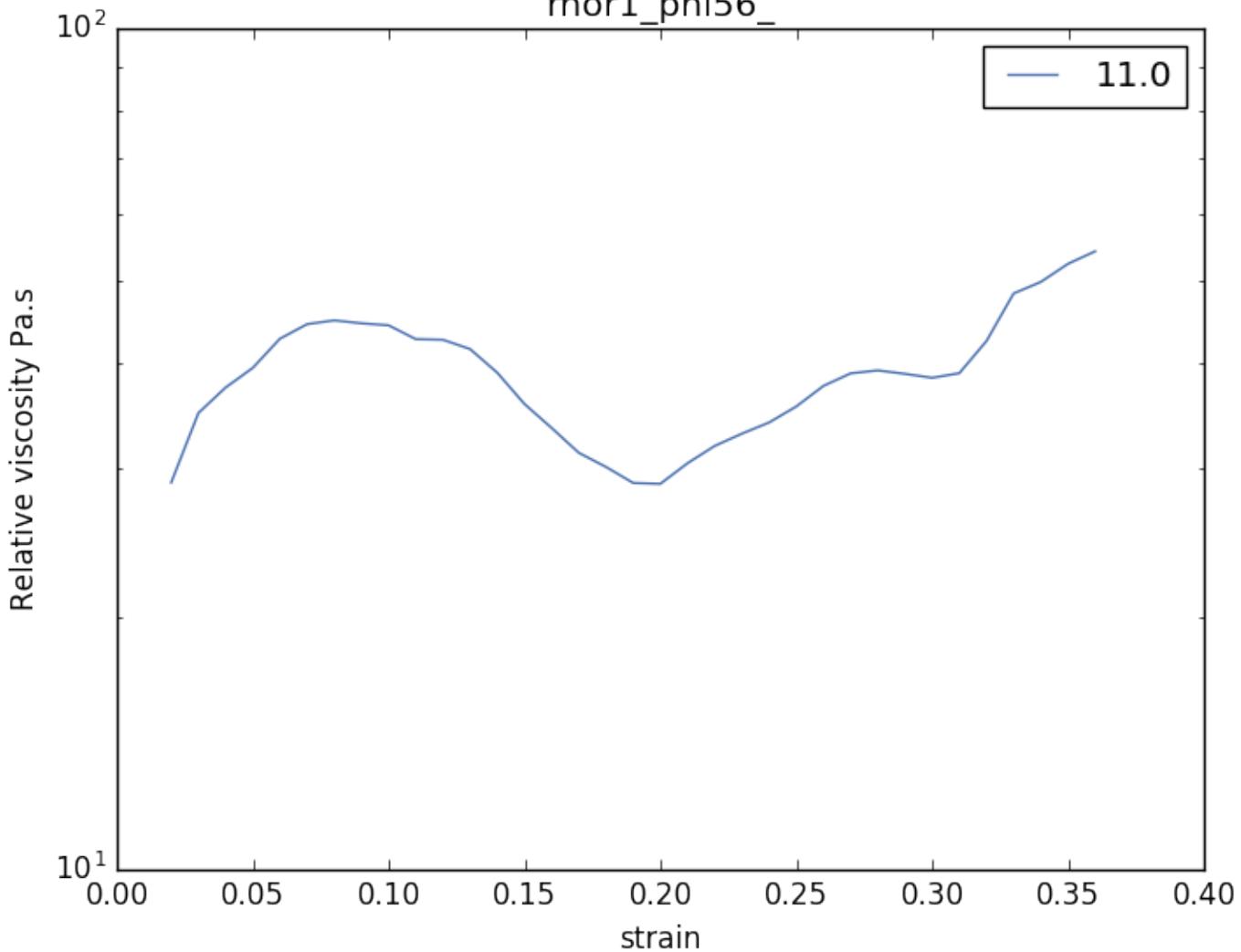
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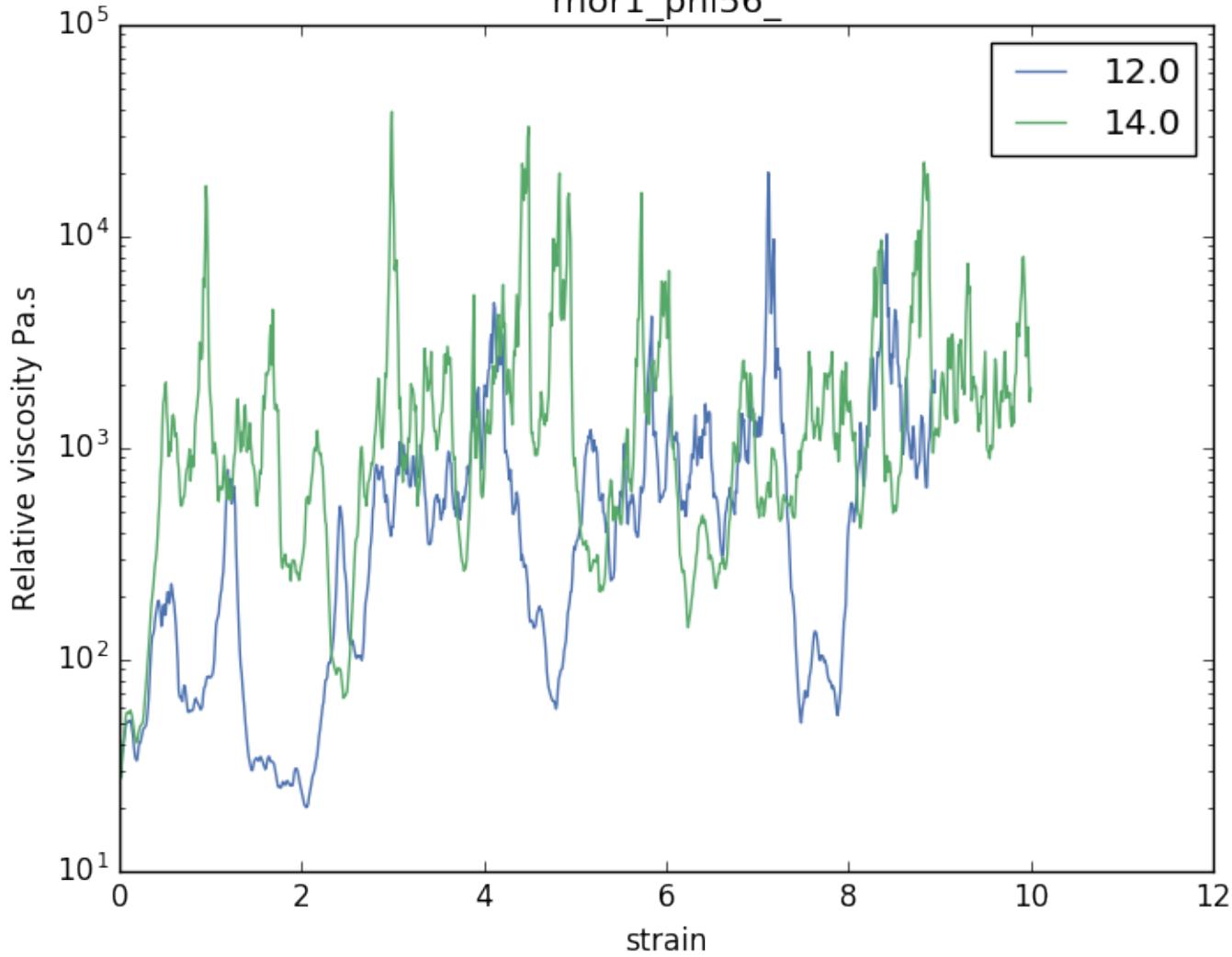
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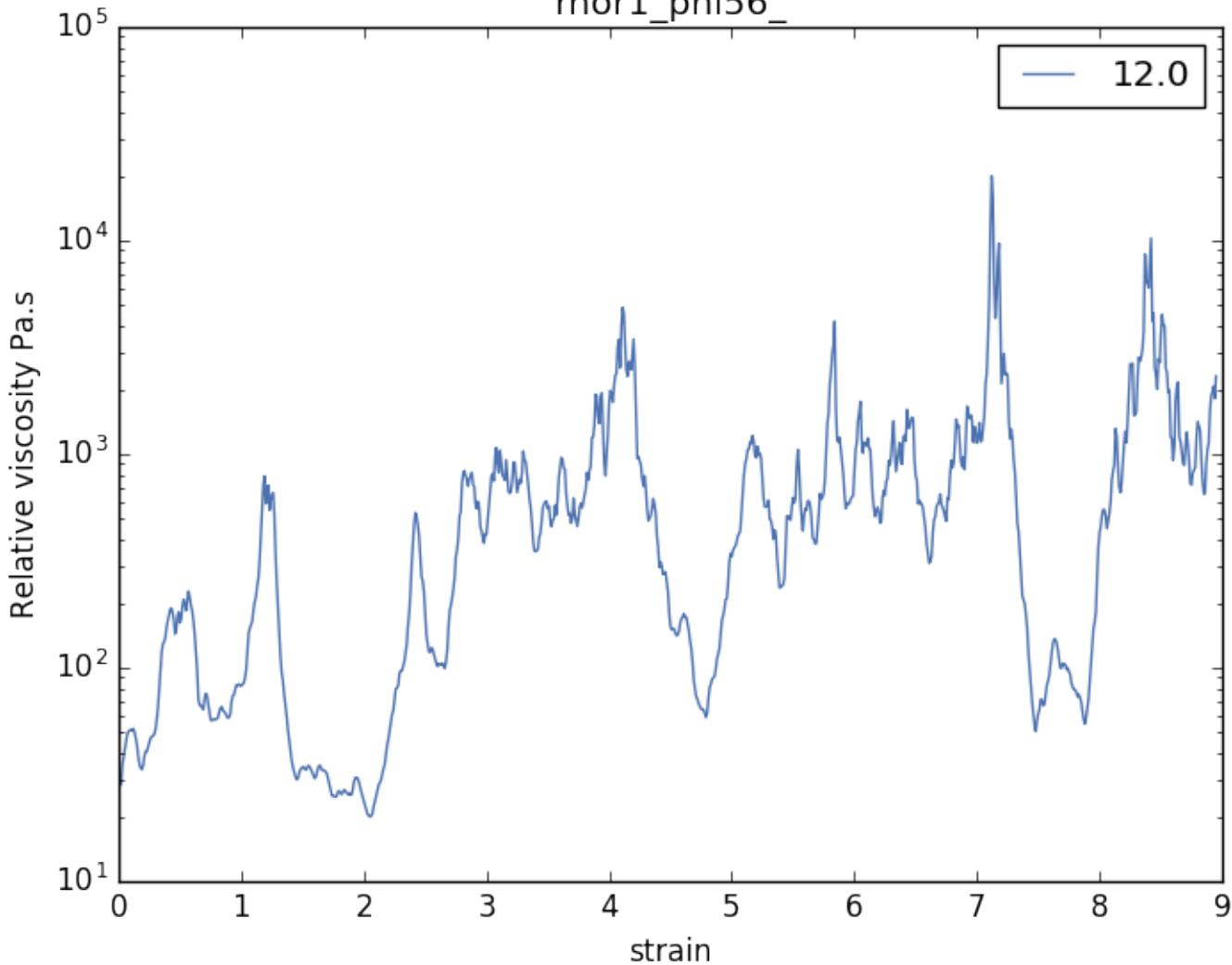
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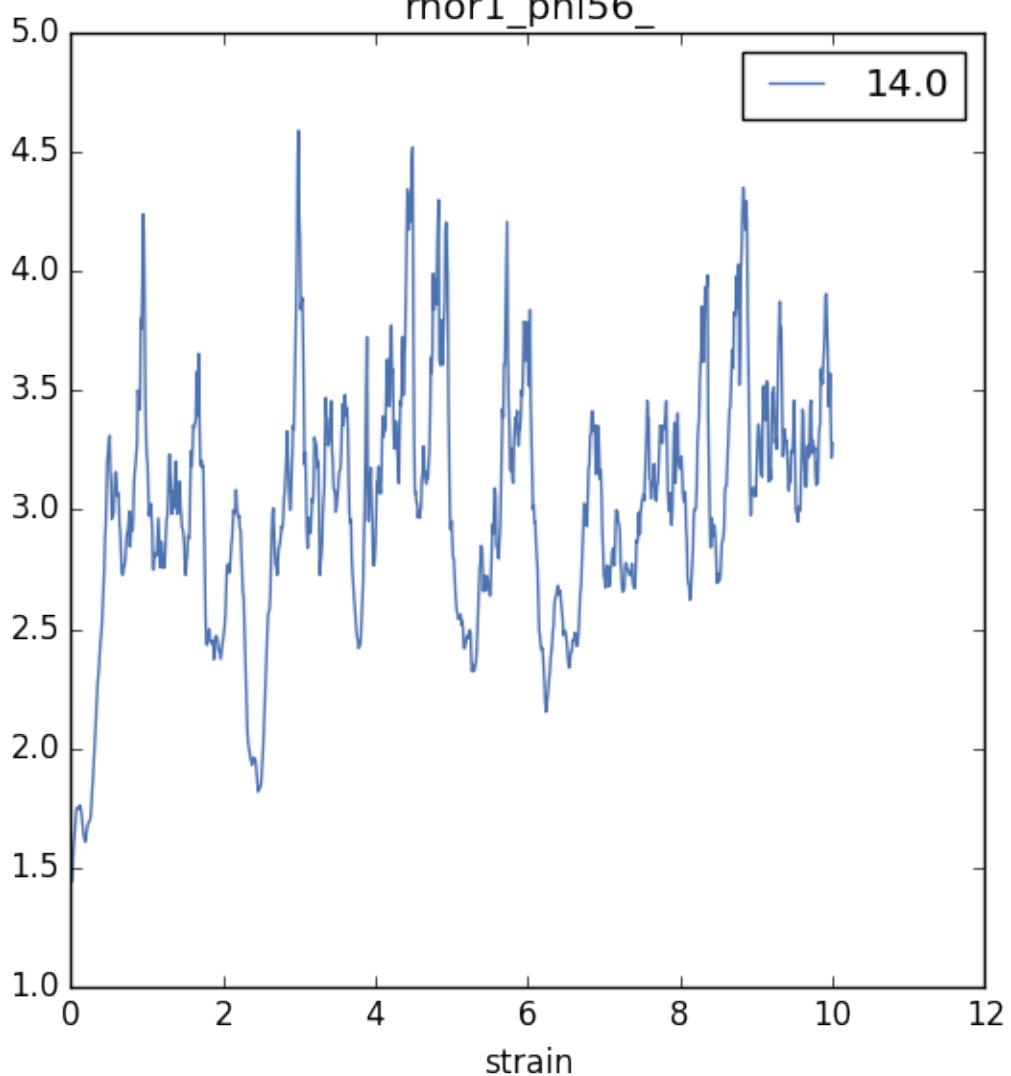


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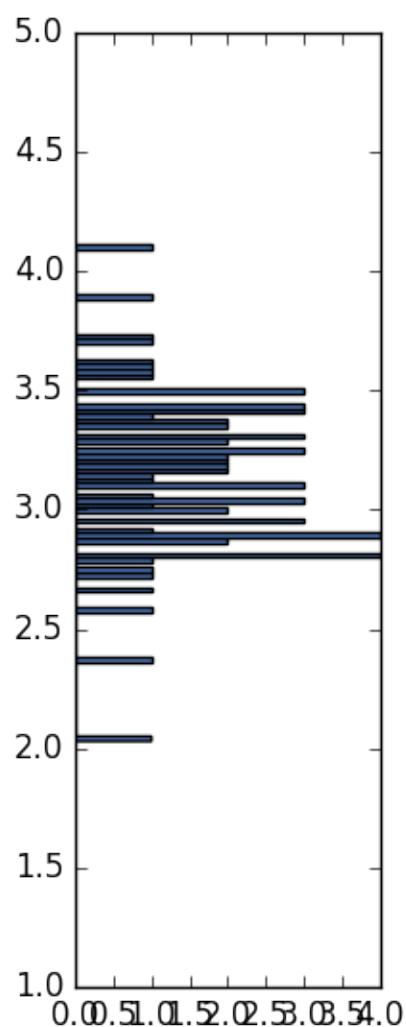


rhor1\_phi56\_

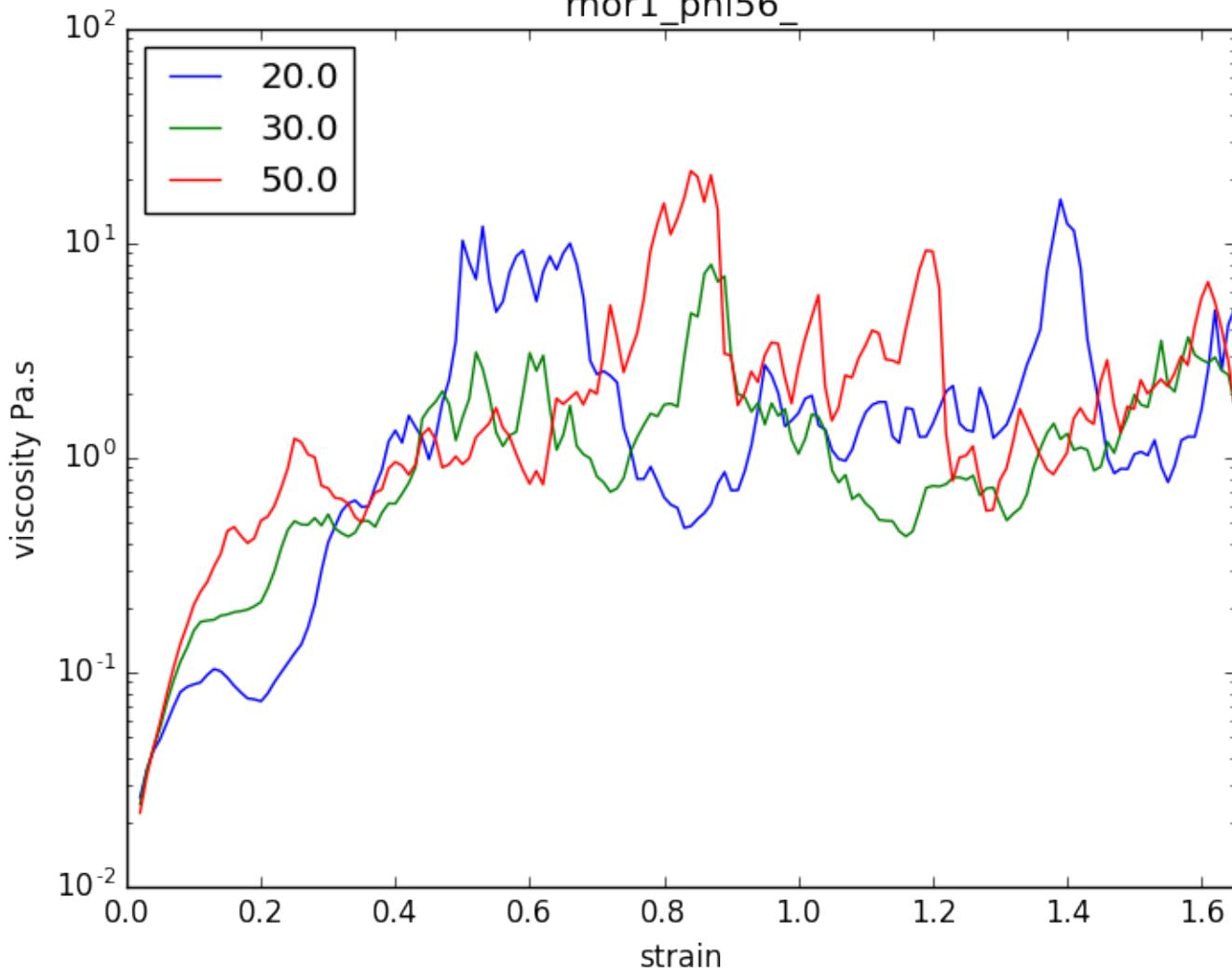
Relative viscosity Pa.s



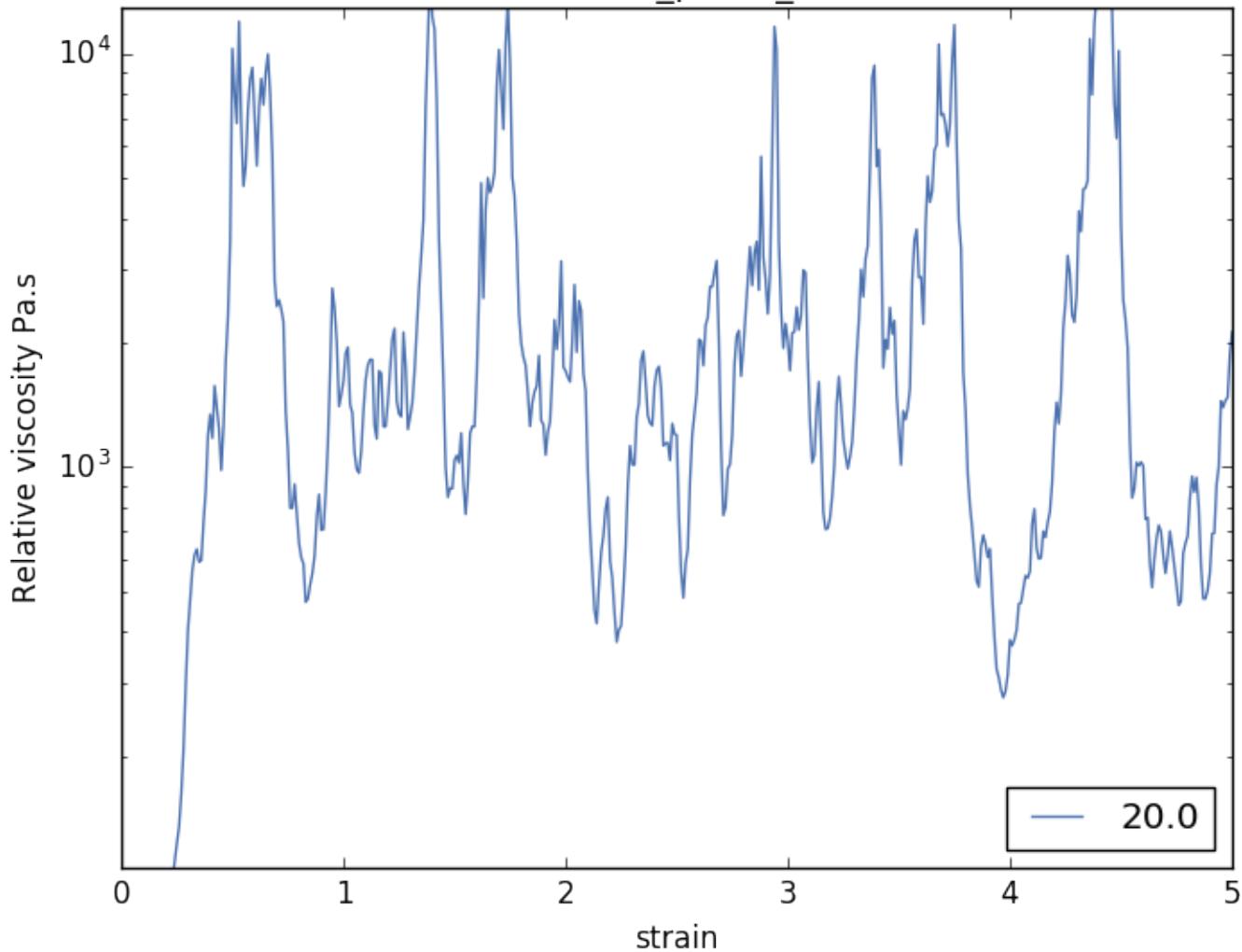
14.0



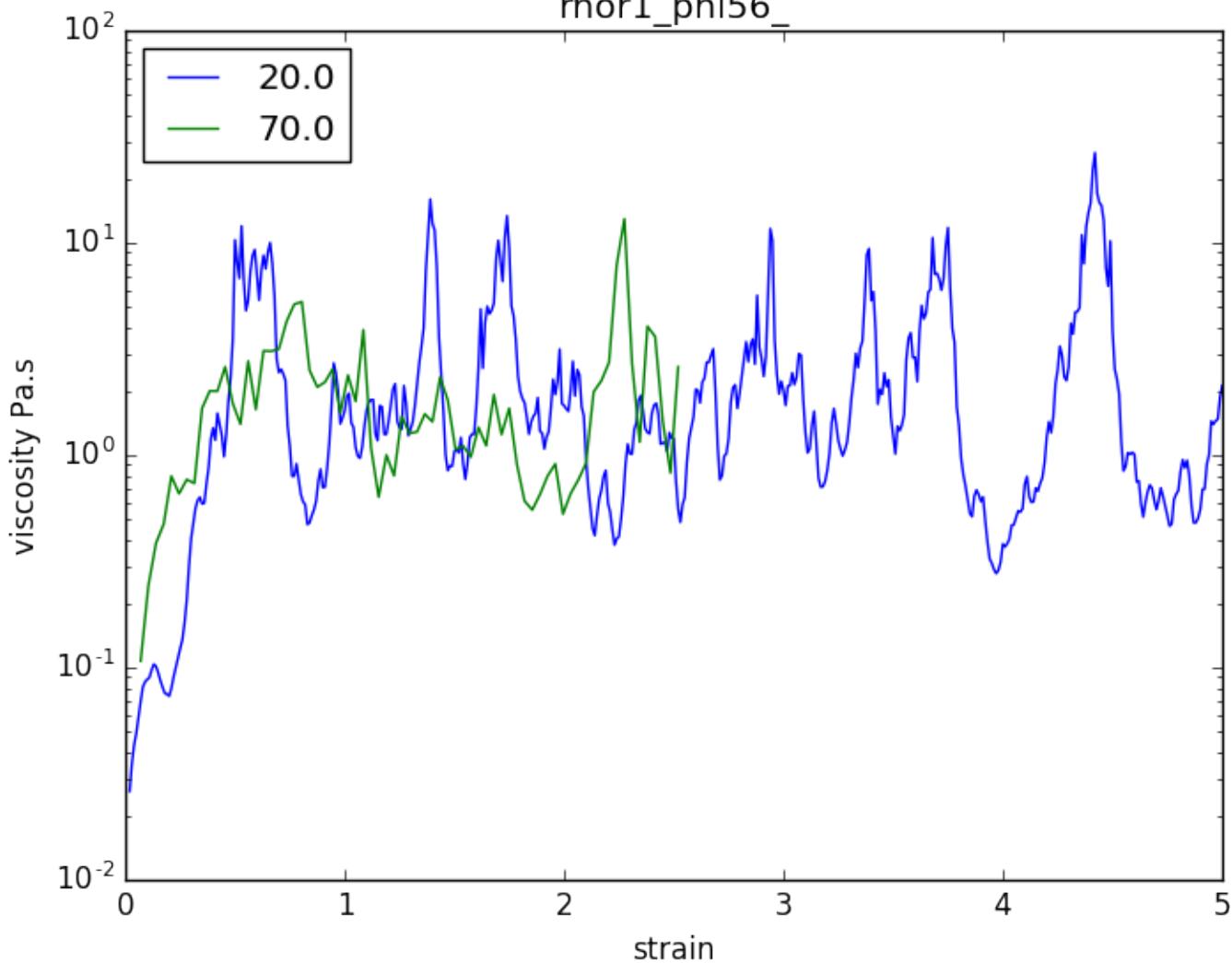
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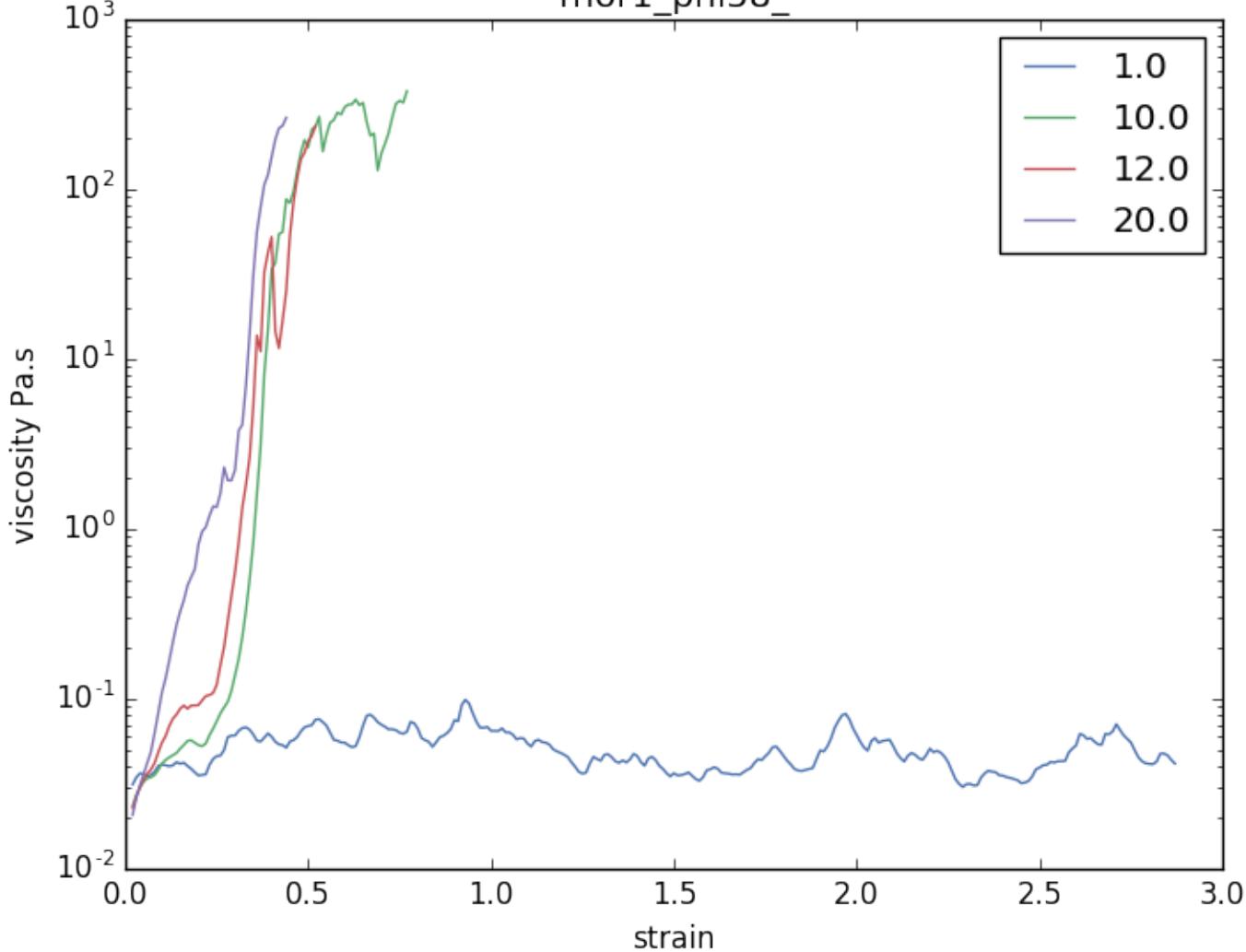
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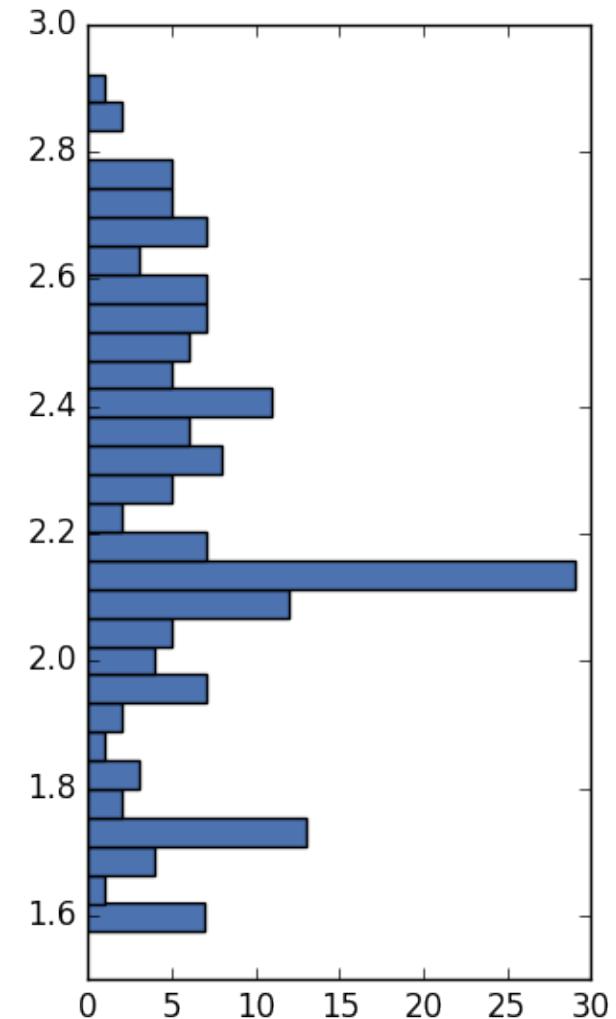
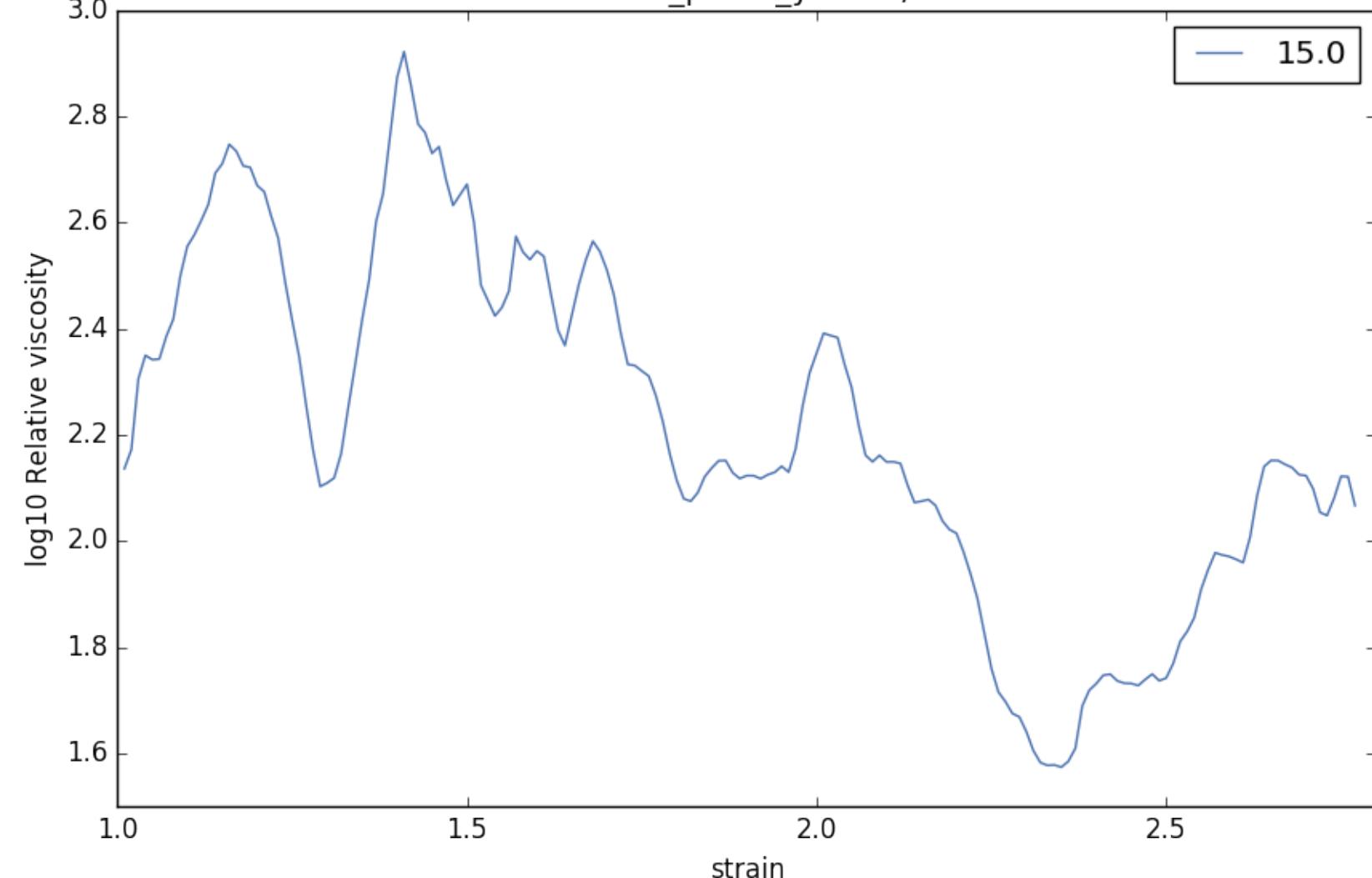
rhor1\_phi56



rhor1\_phi58

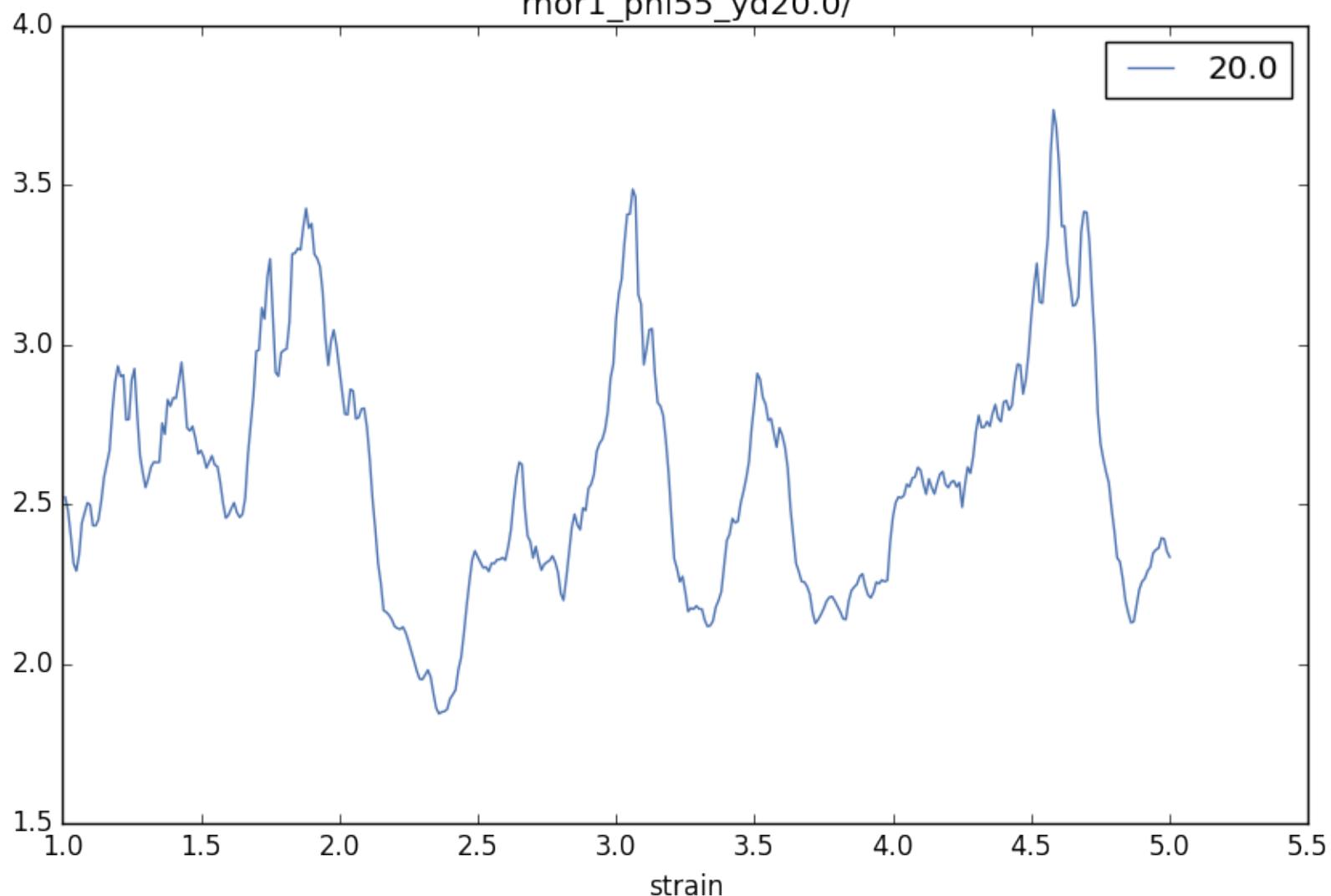


rhor1\_phi55\_yd15.0/

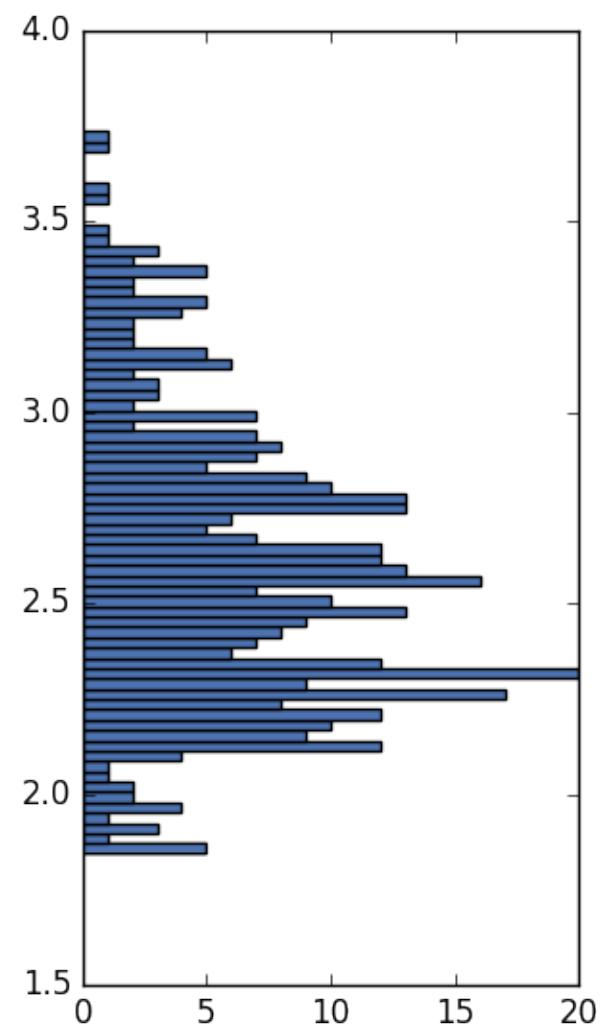


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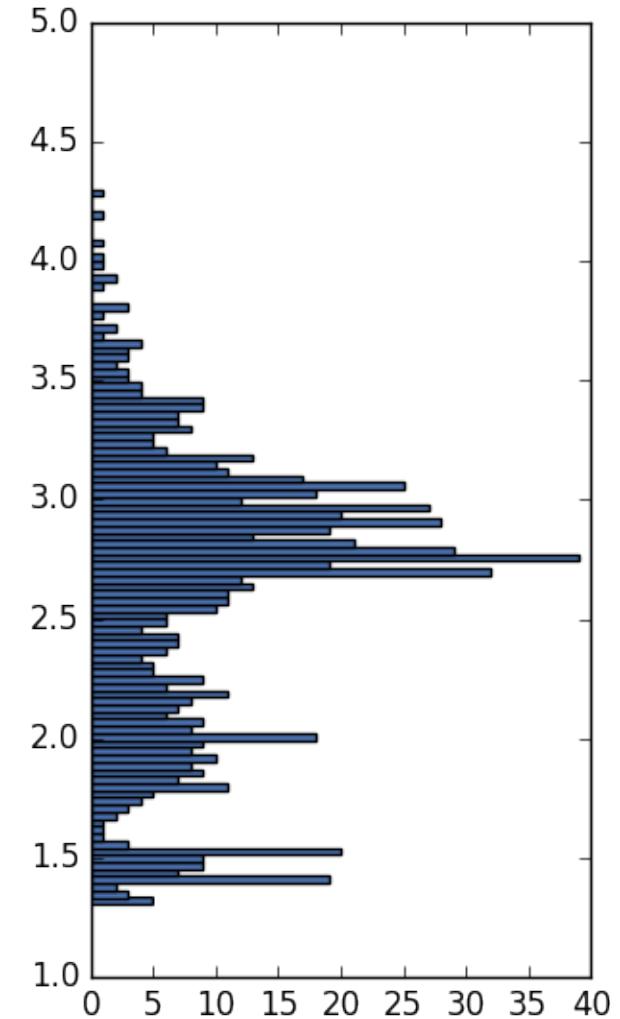
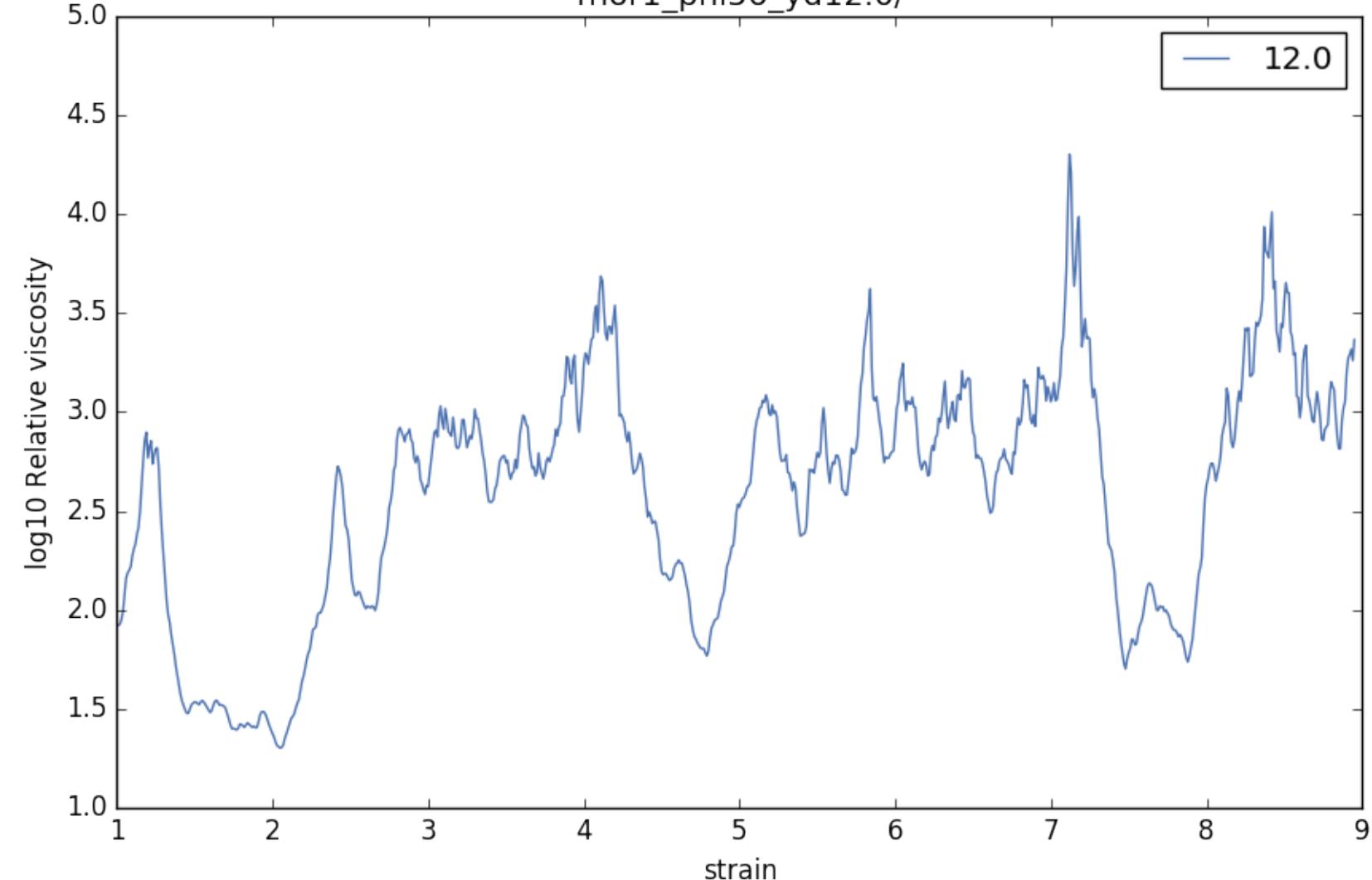
log<sub>10</sub> Relative viscosity



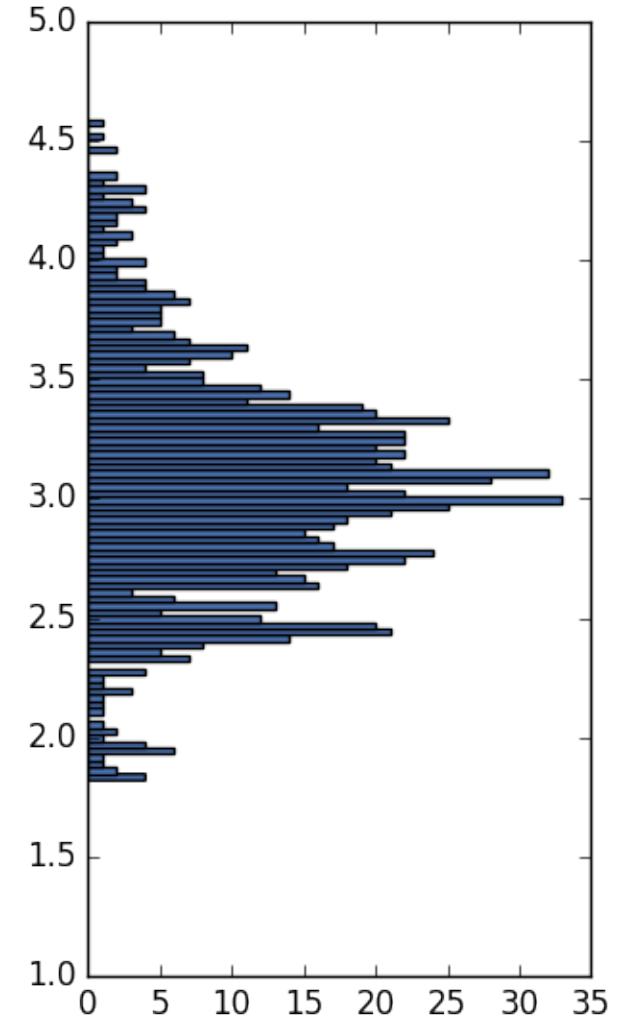
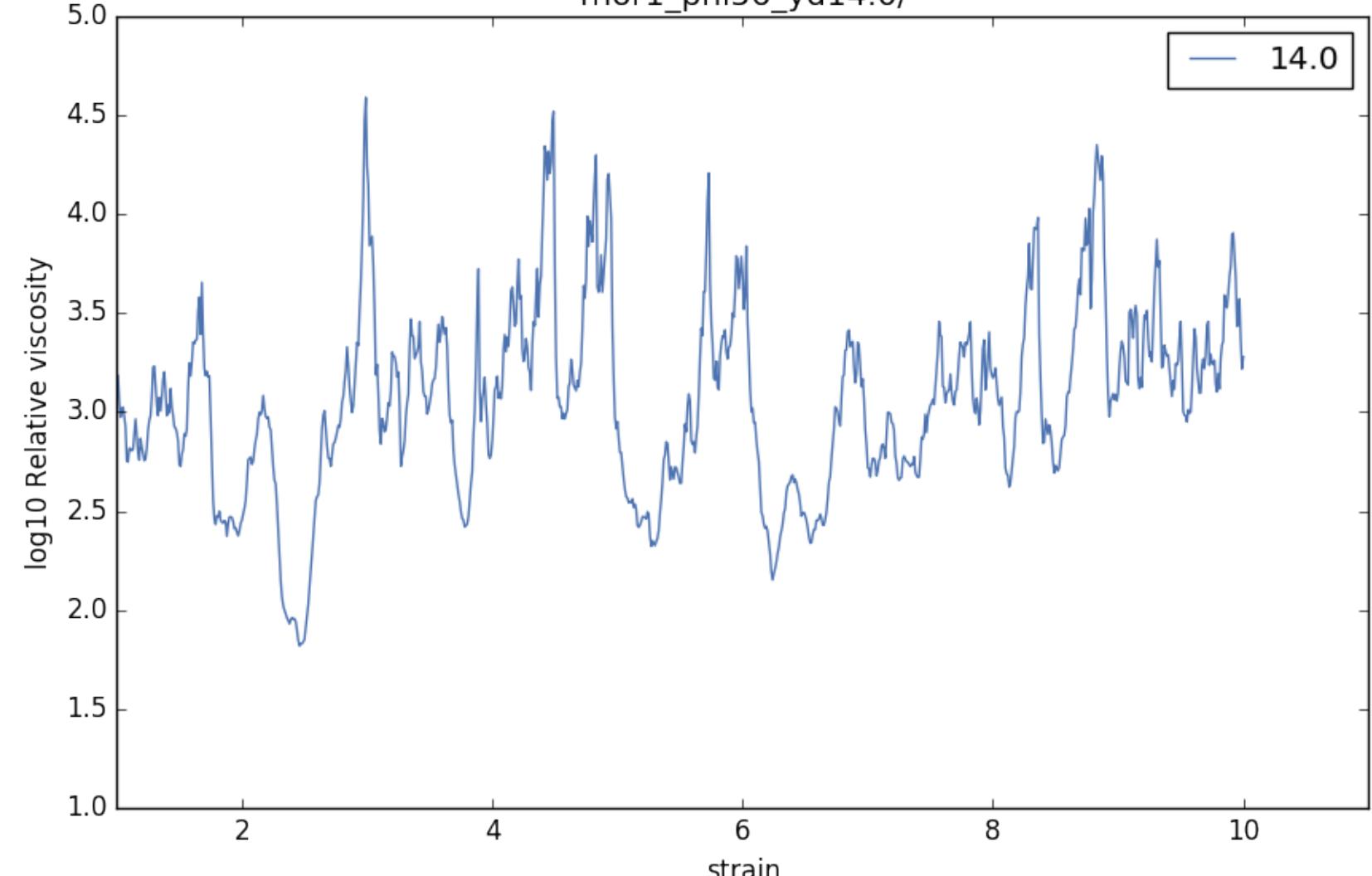
20.0

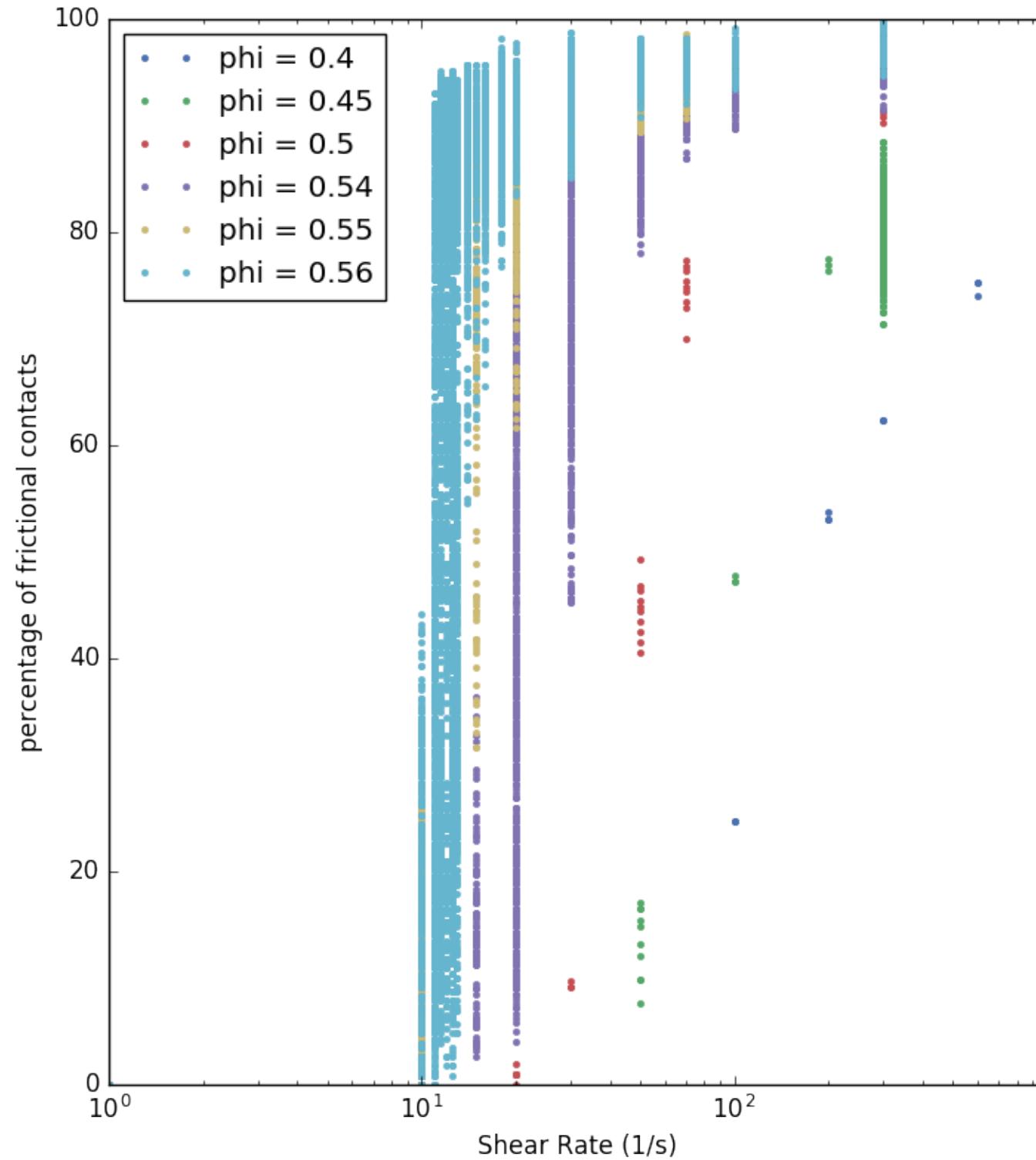
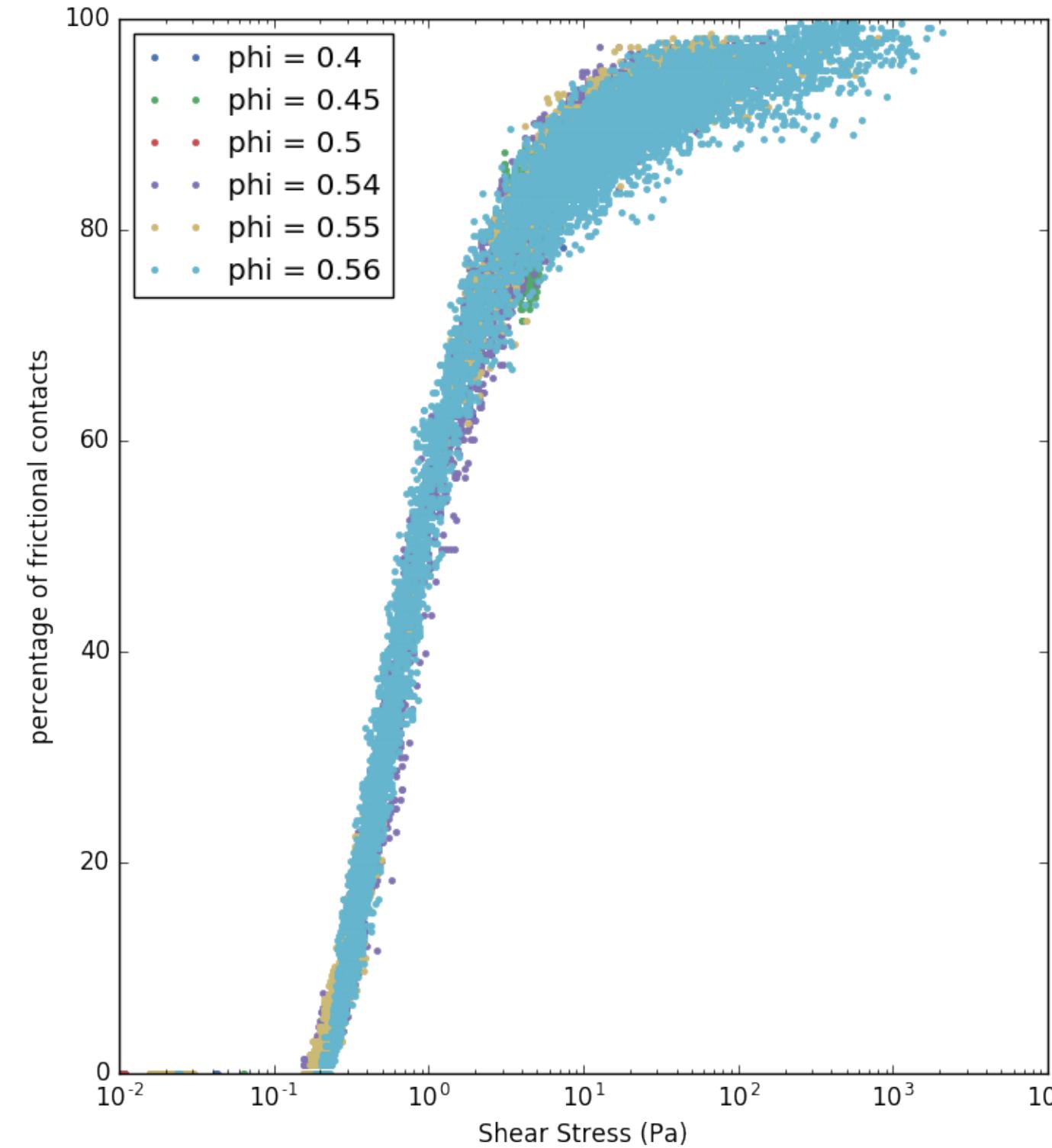


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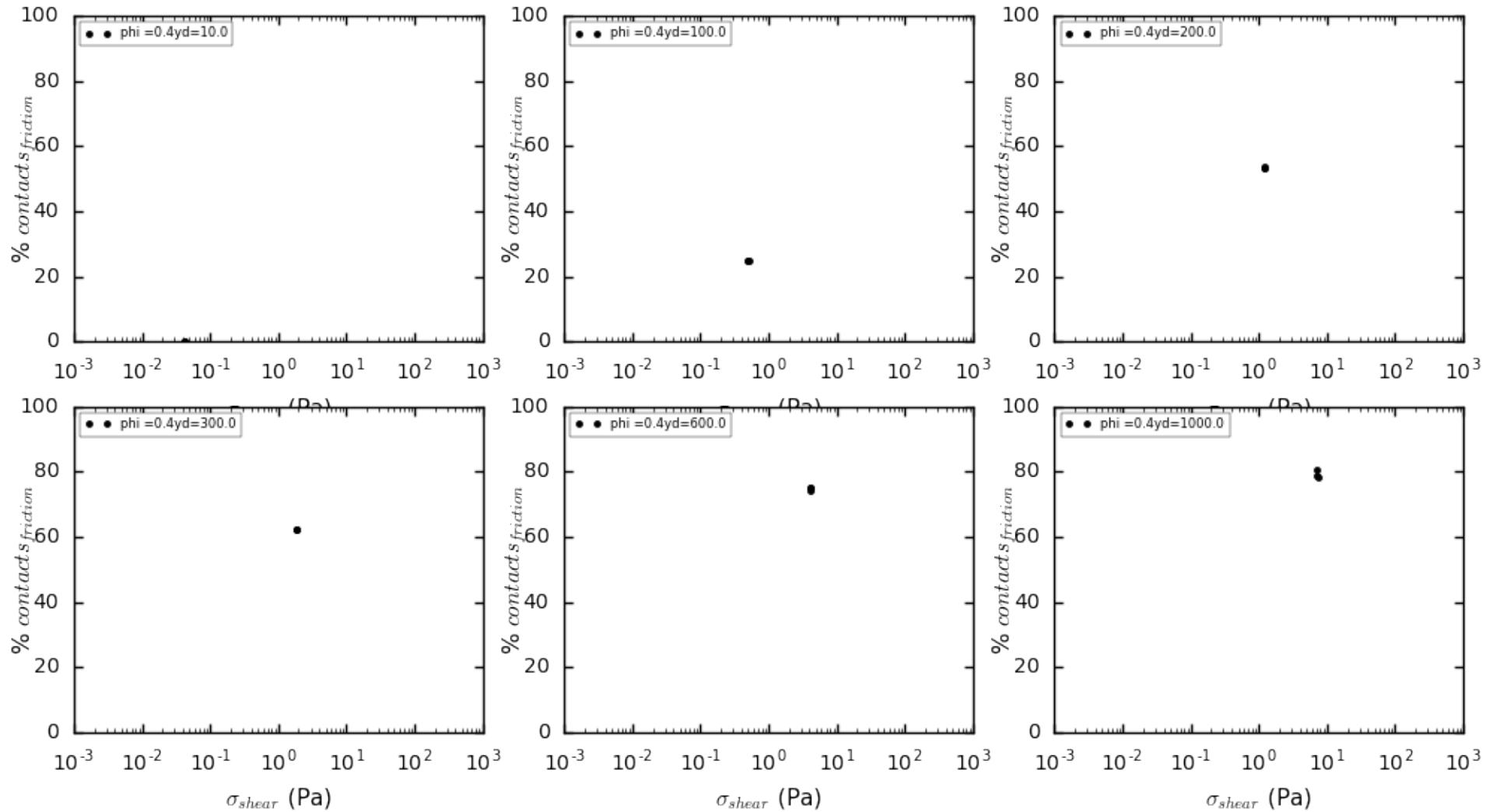


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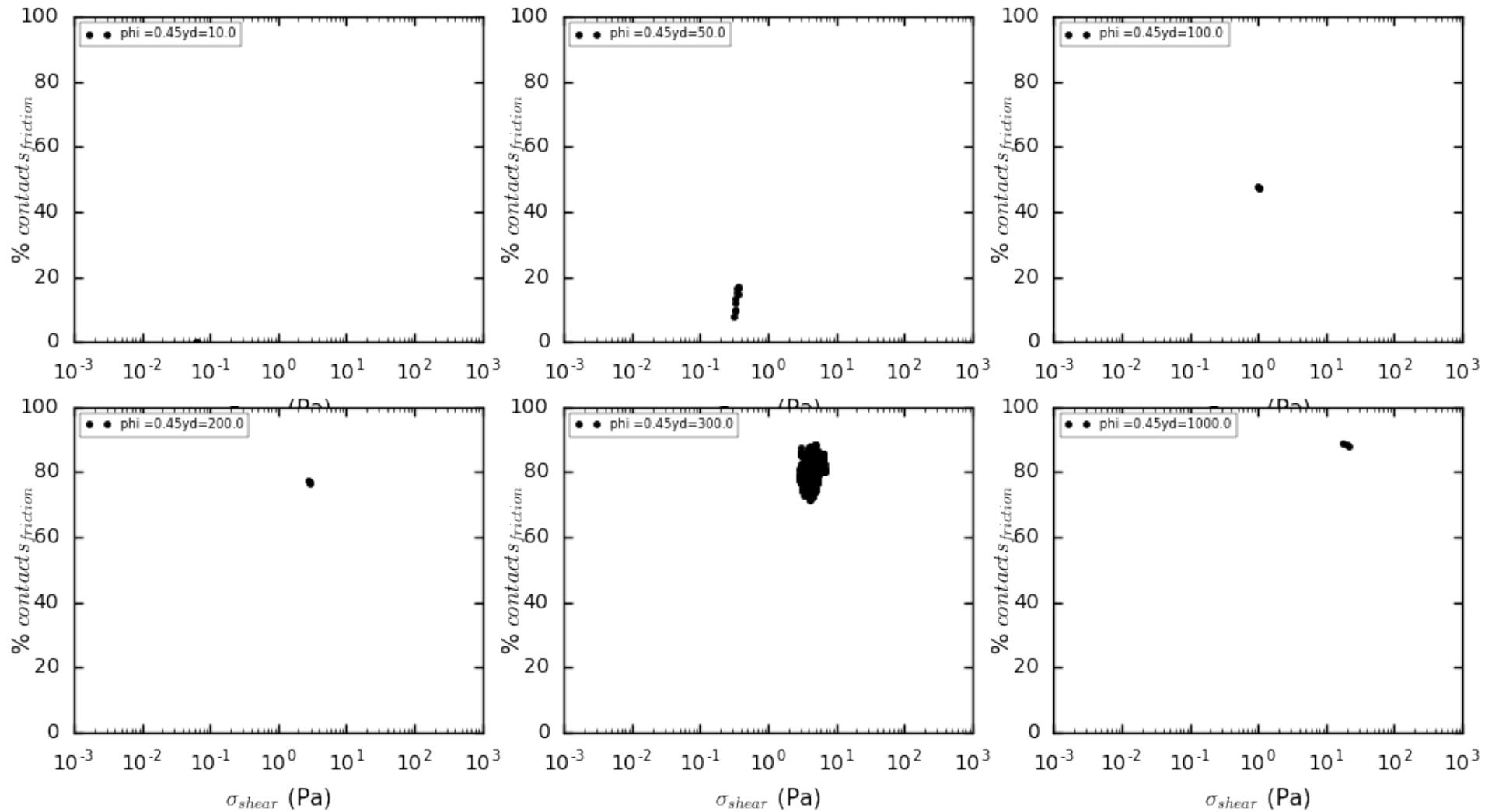




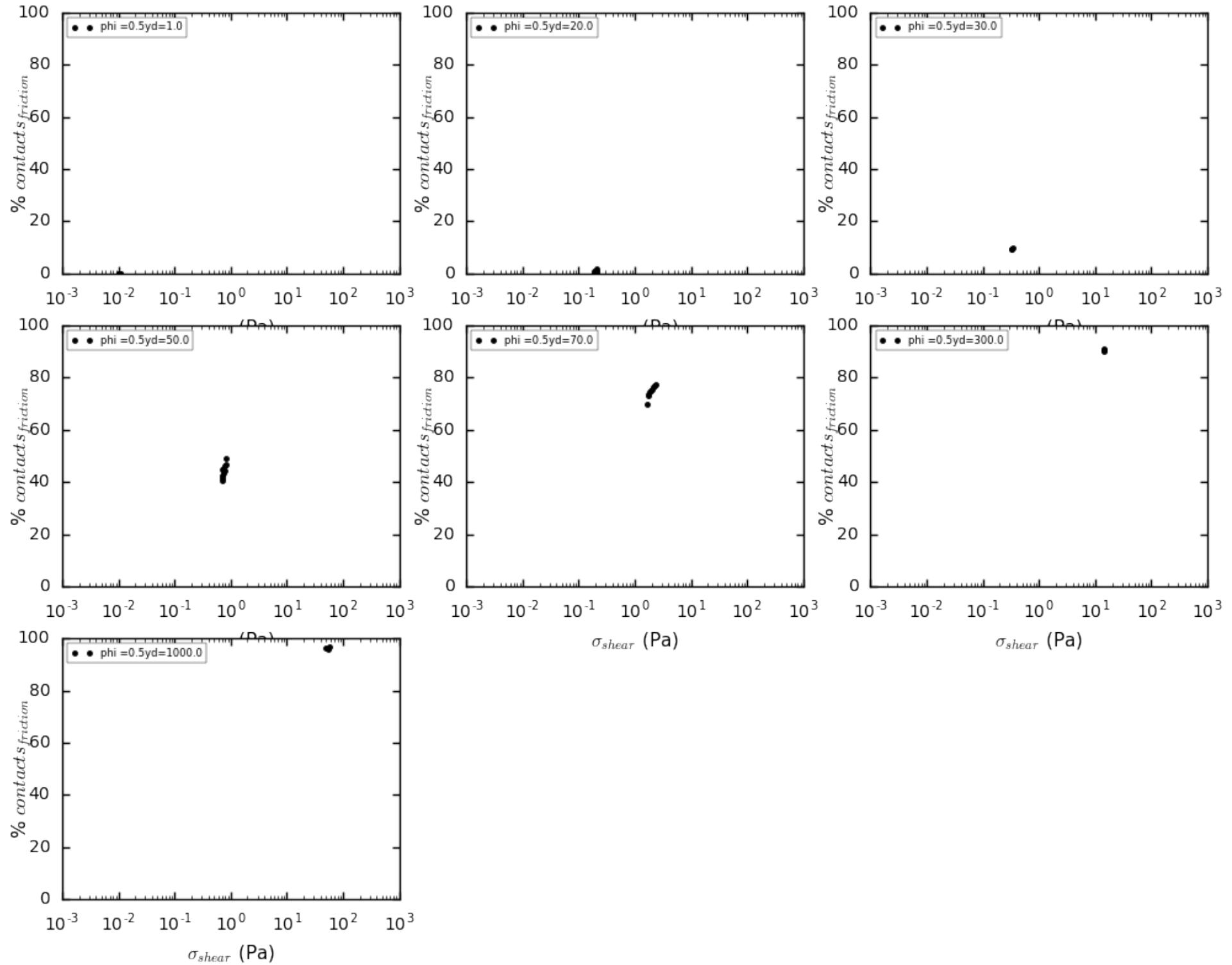
$\sigma_{shear}$  vs  $contact_{friction}$  for  $\phi = 0.4$



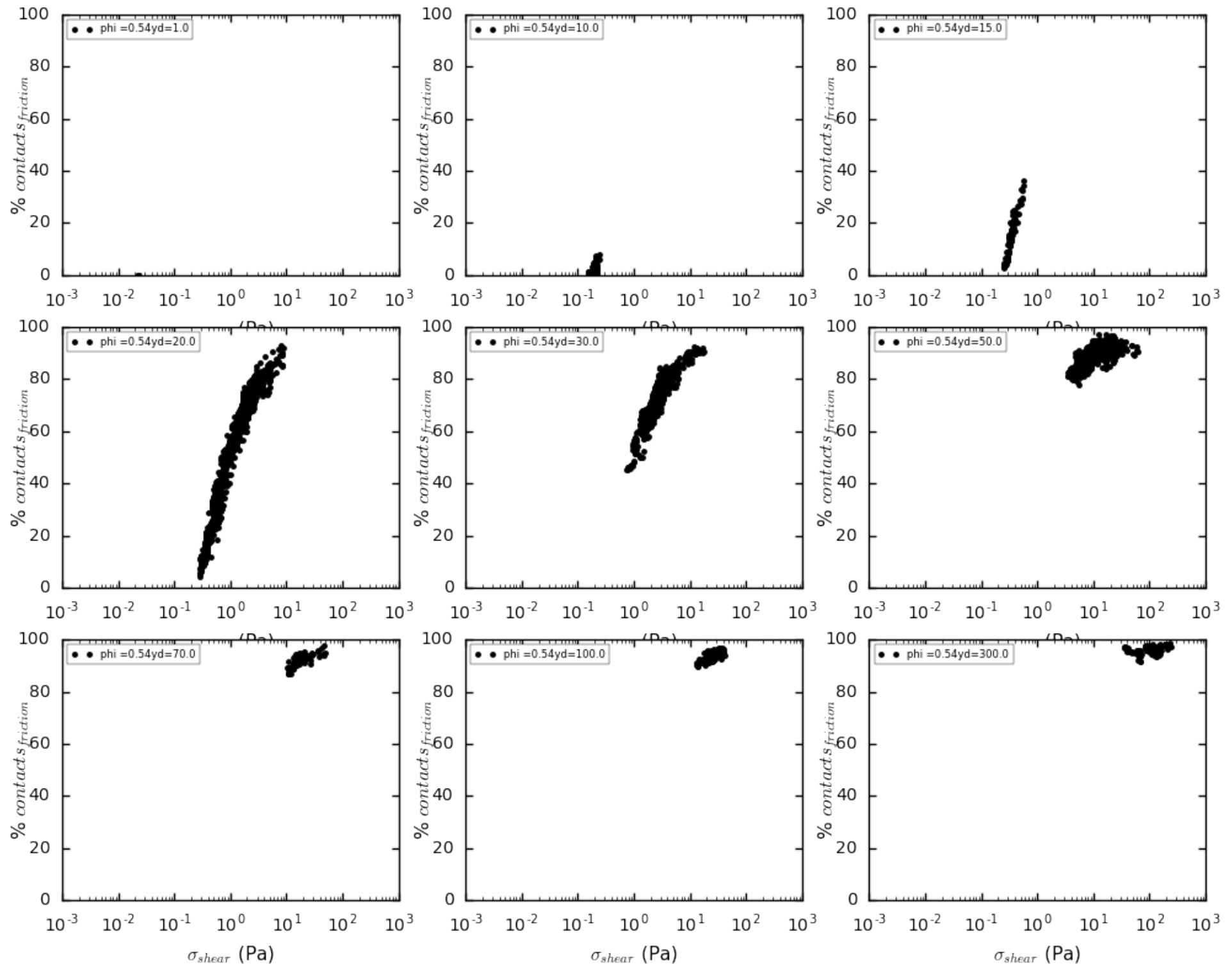
$\sigma_{shear}$  vs  $contact_{friction}$  for  $\phi = 0.45$



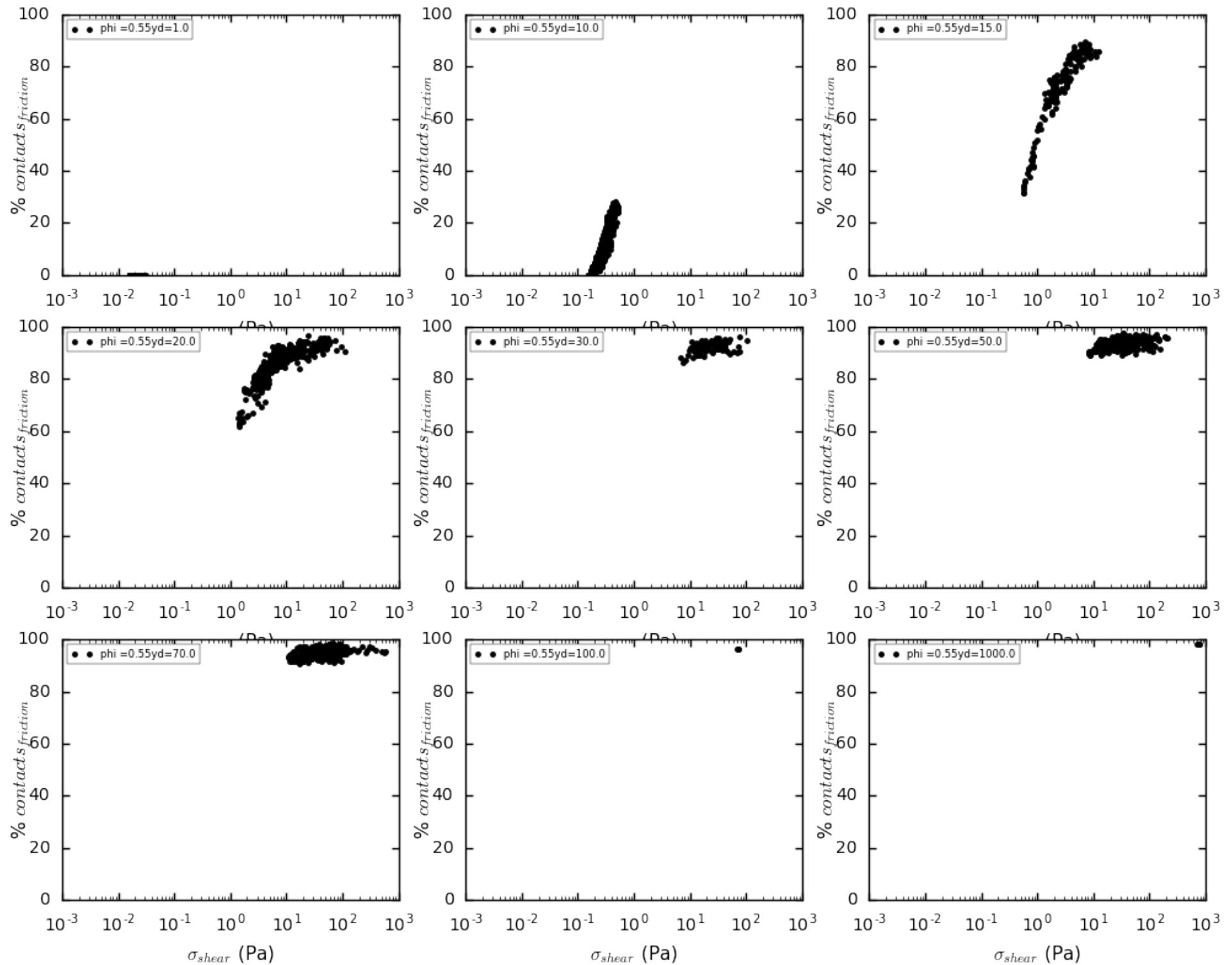
$\sigma_{shear}$  vs  $contact_{friction}$  for  $\phi = 0.5$



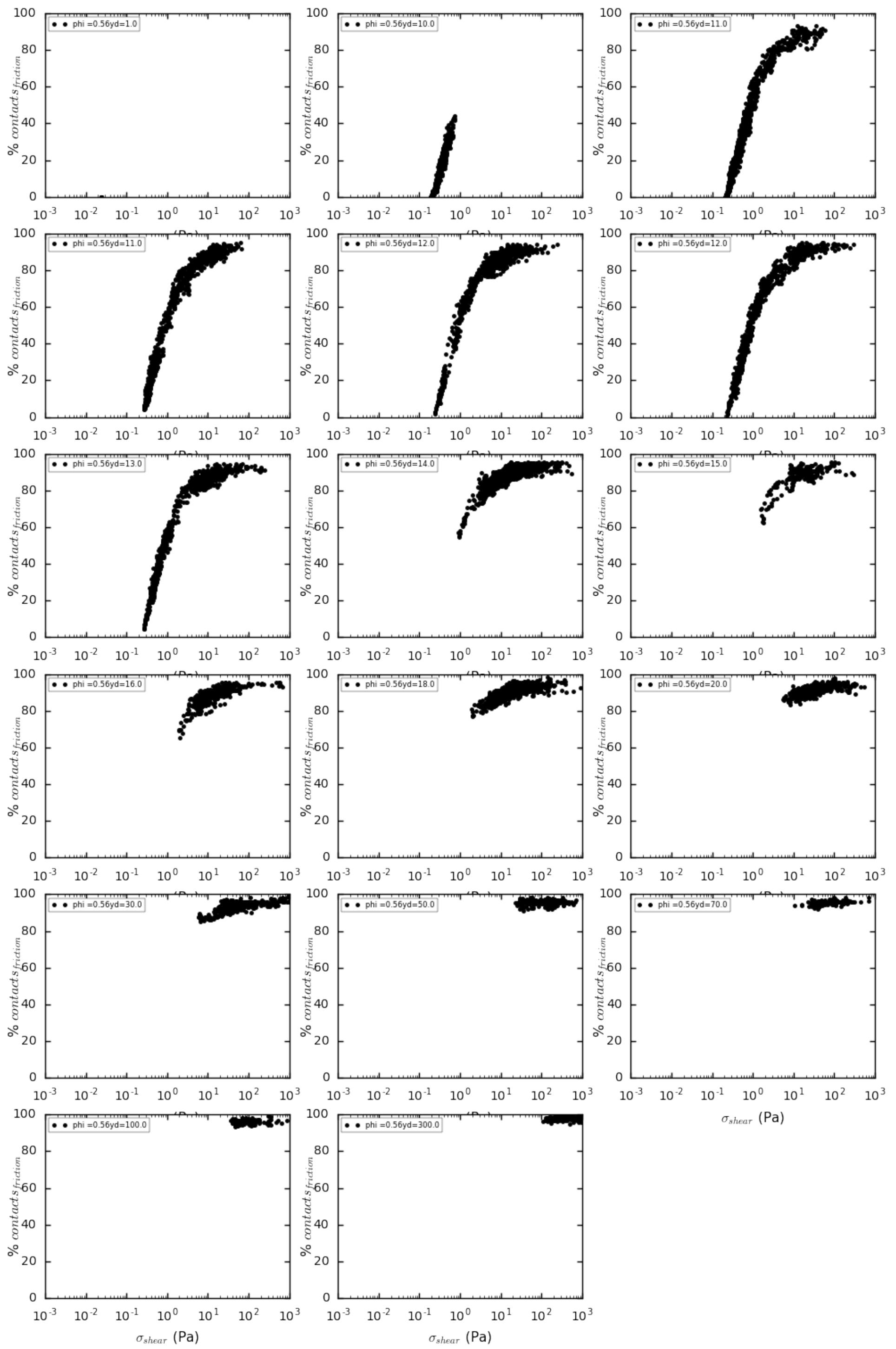
$\sigma_{shear}$  vs  $contact_{friction}$  for  $\phi = 0.54$

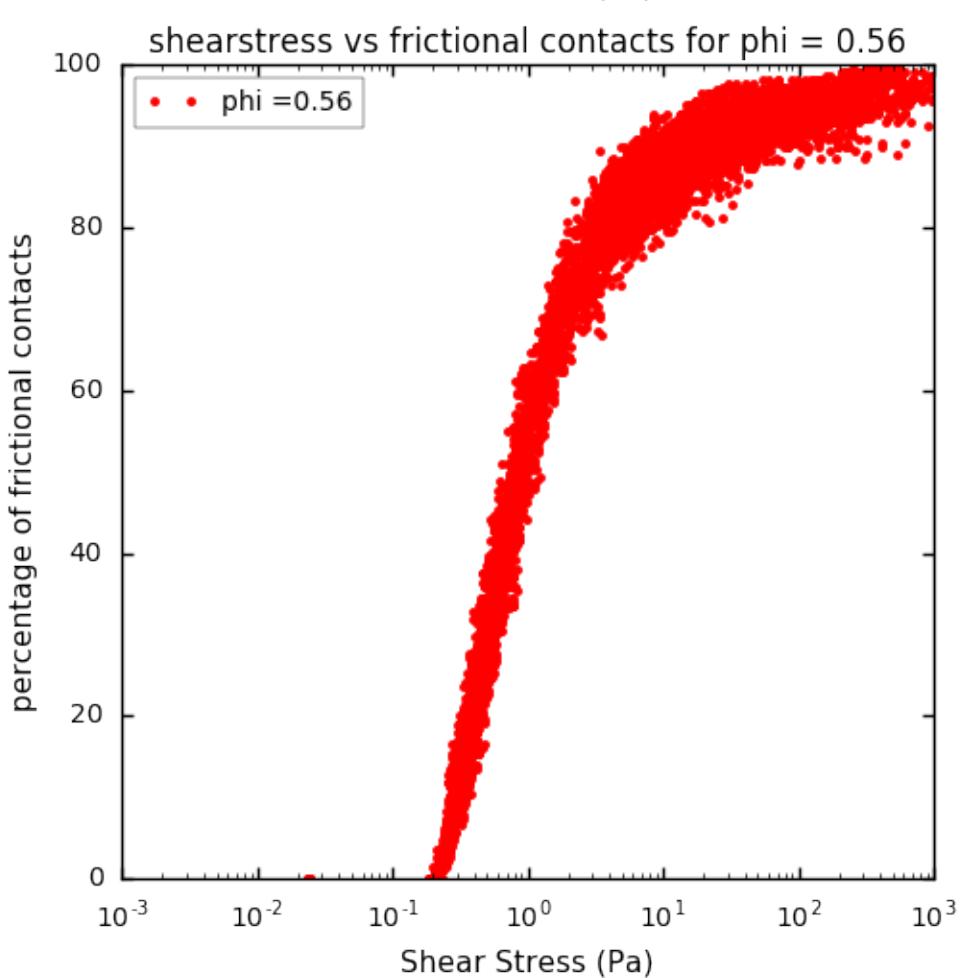
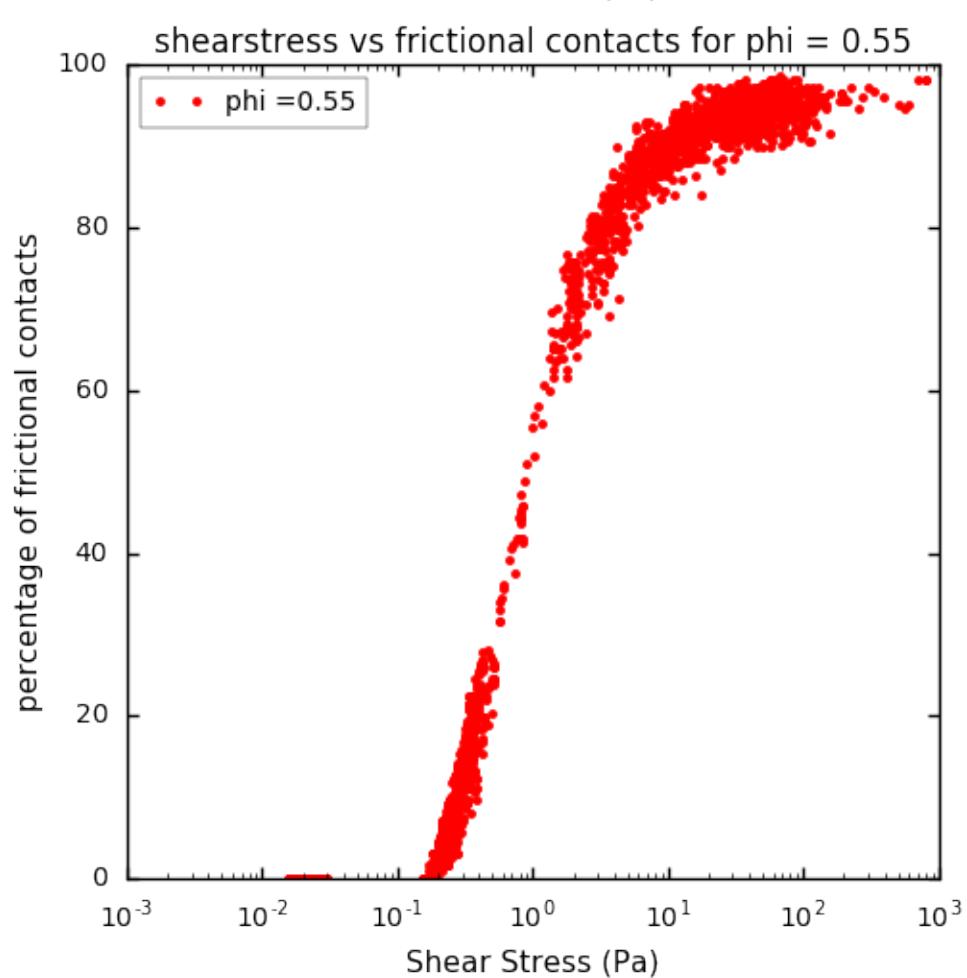
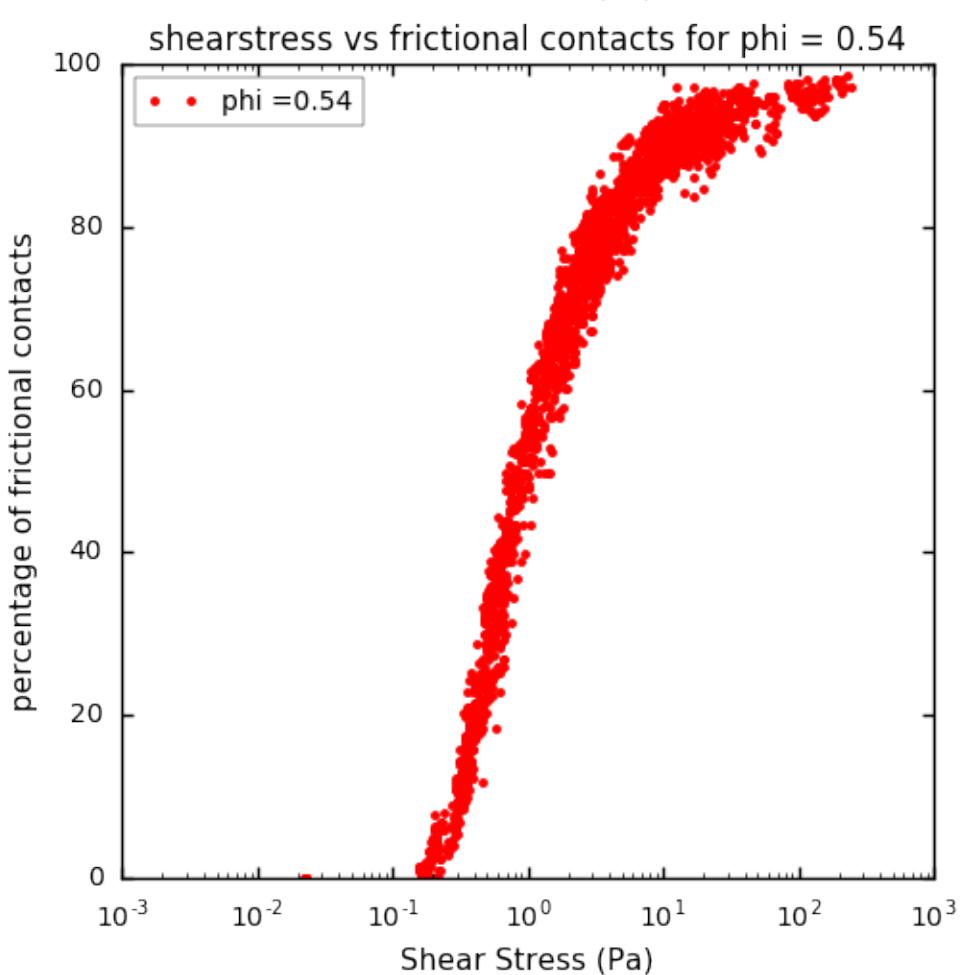
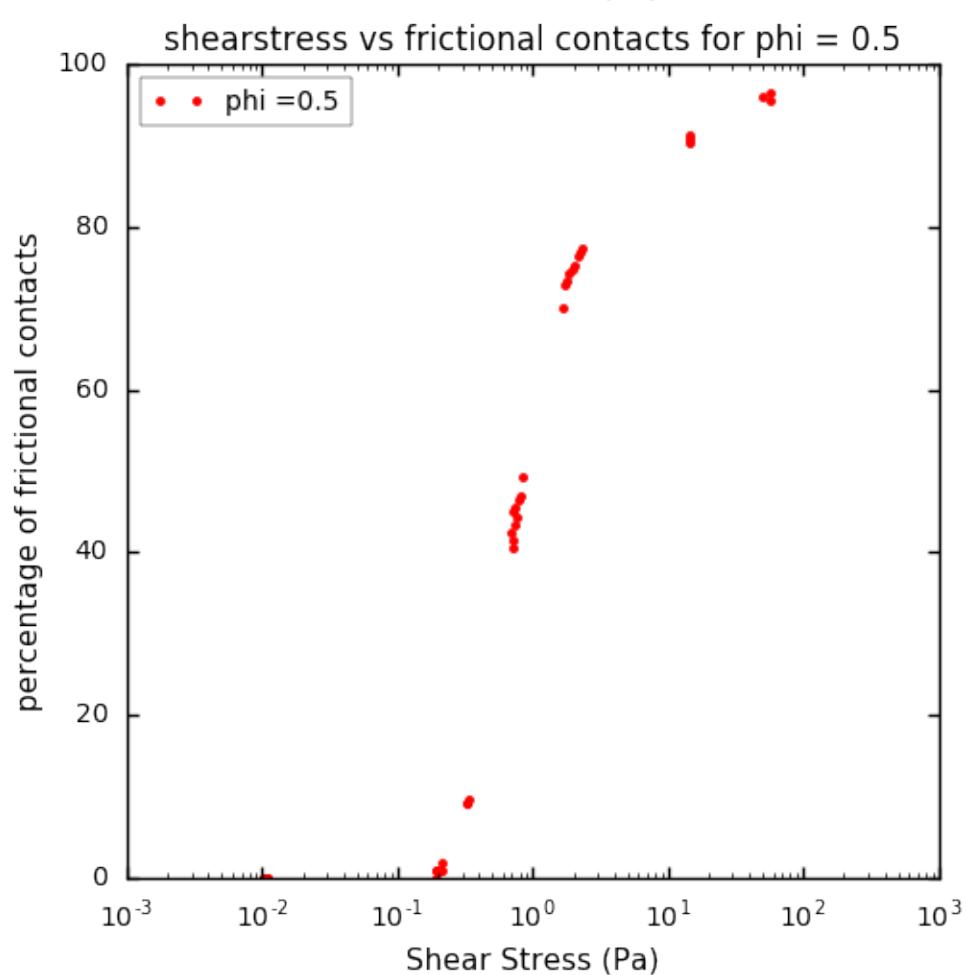
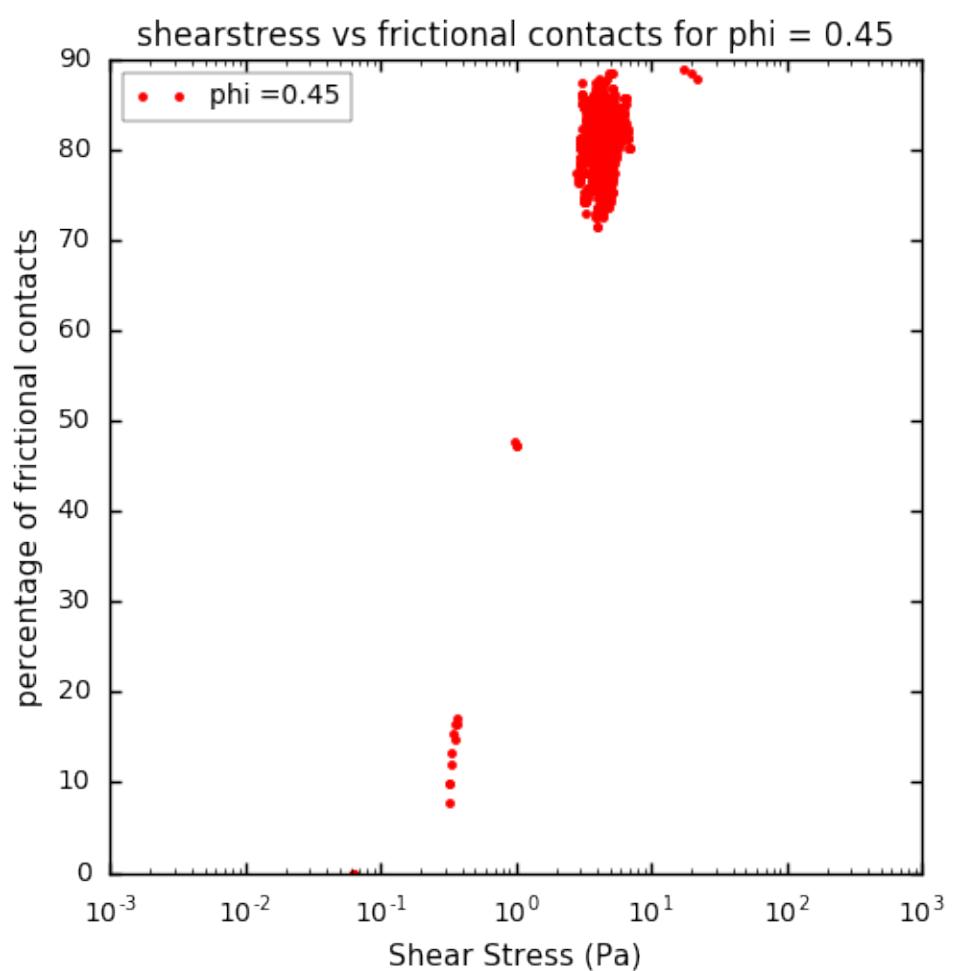
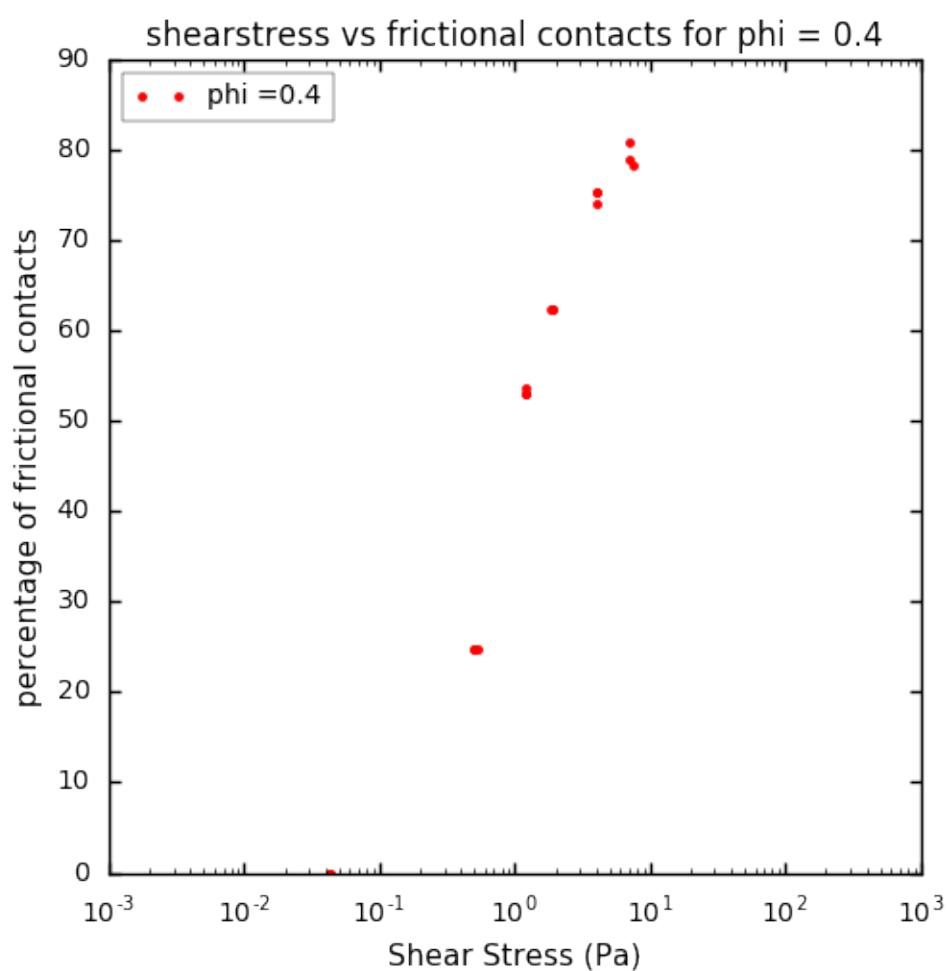


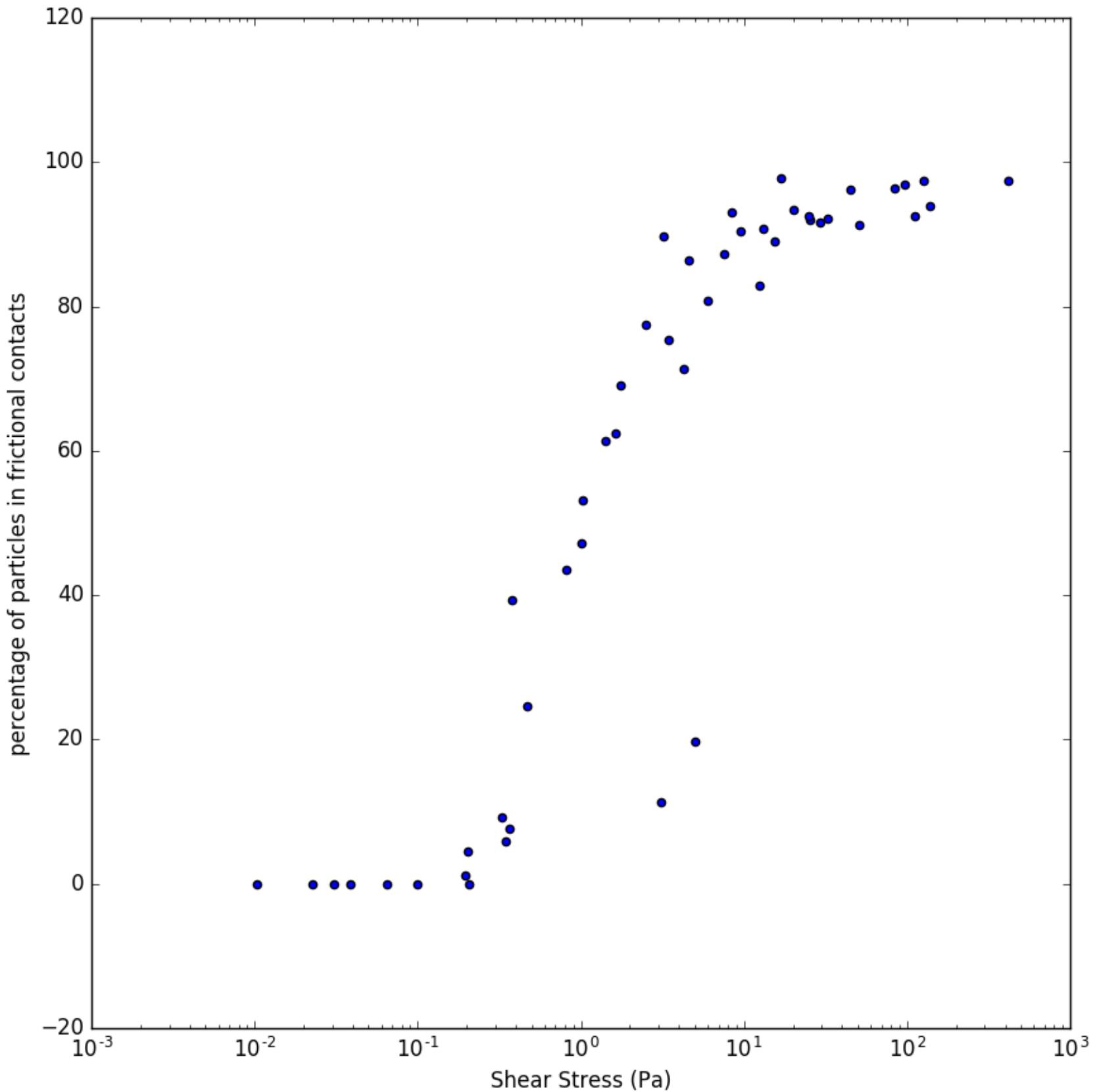
$\sigma_{shear}$  vs  $contact_{friction}$  for  $\phi = 0.55$

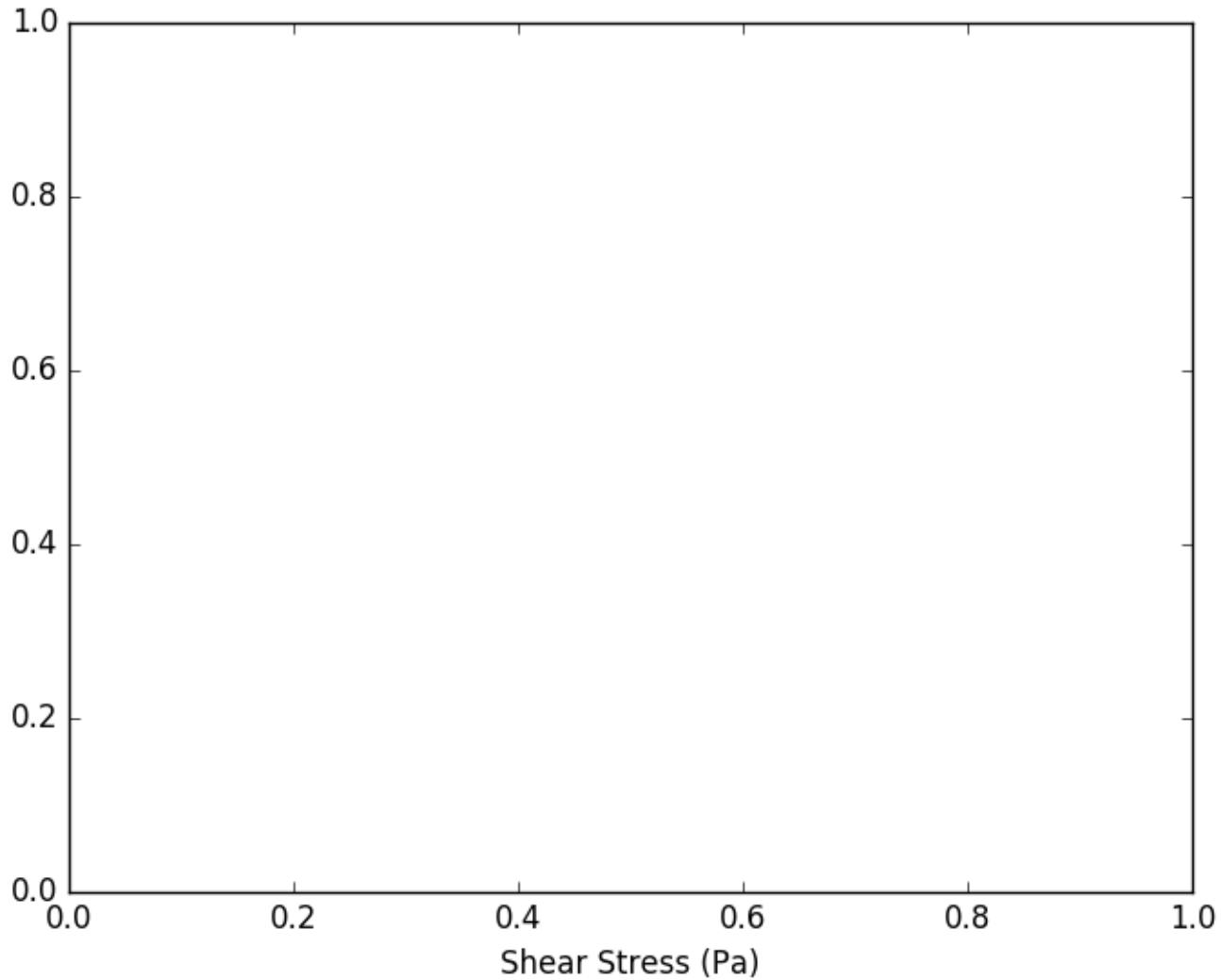


$\sigma_{shear}$  vs  $contact_{friction}$  for  $\phi = 0.56$

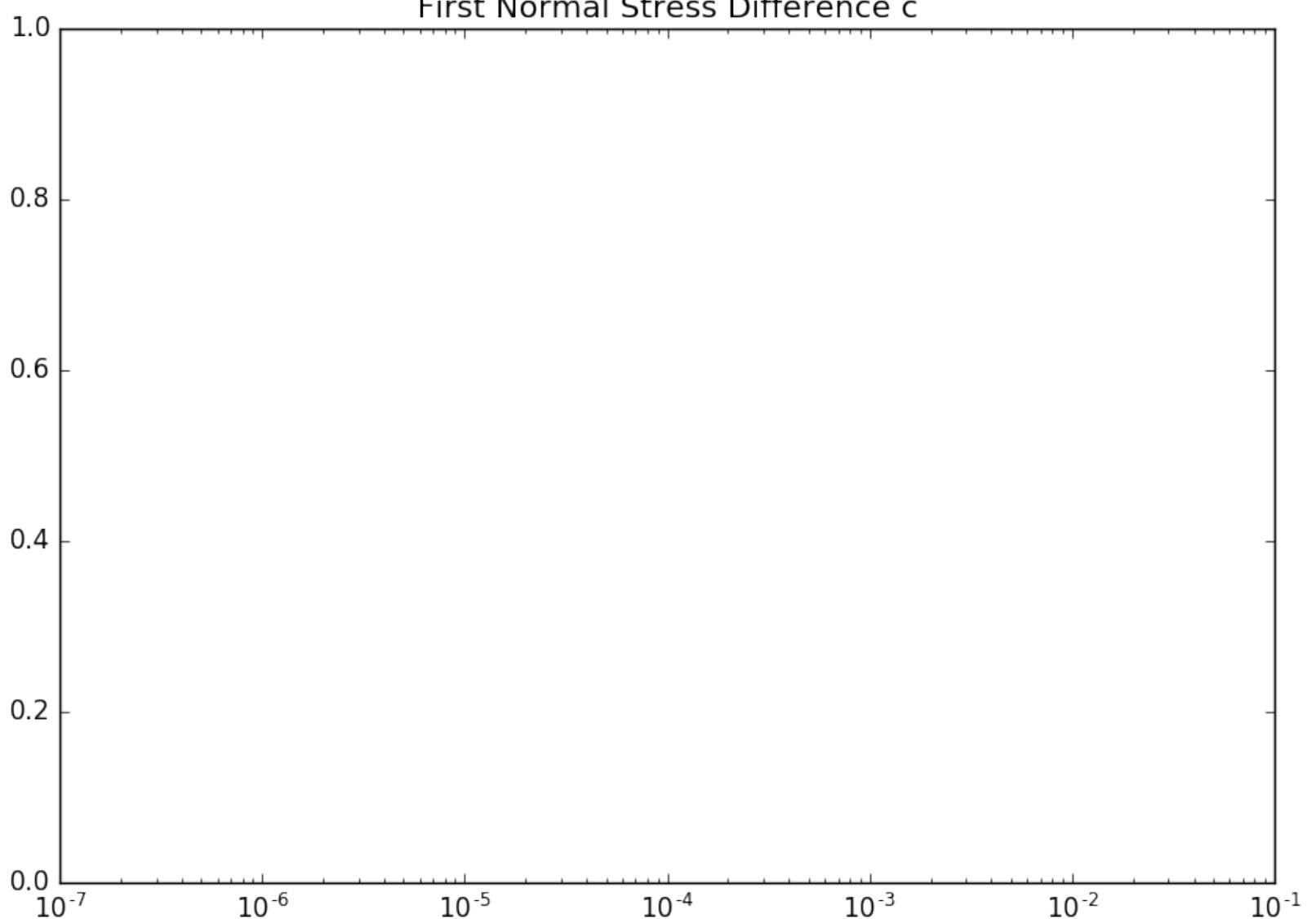




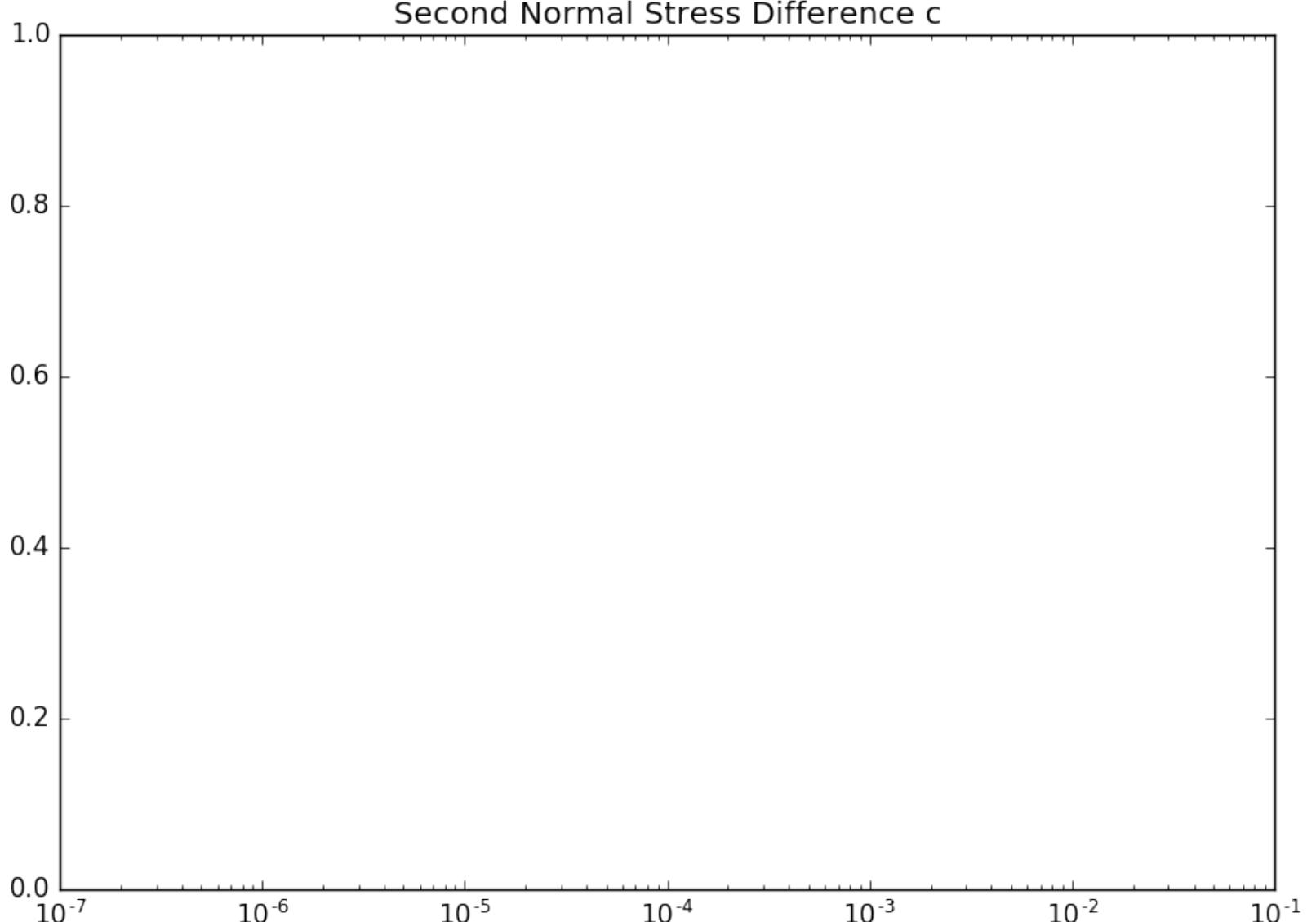




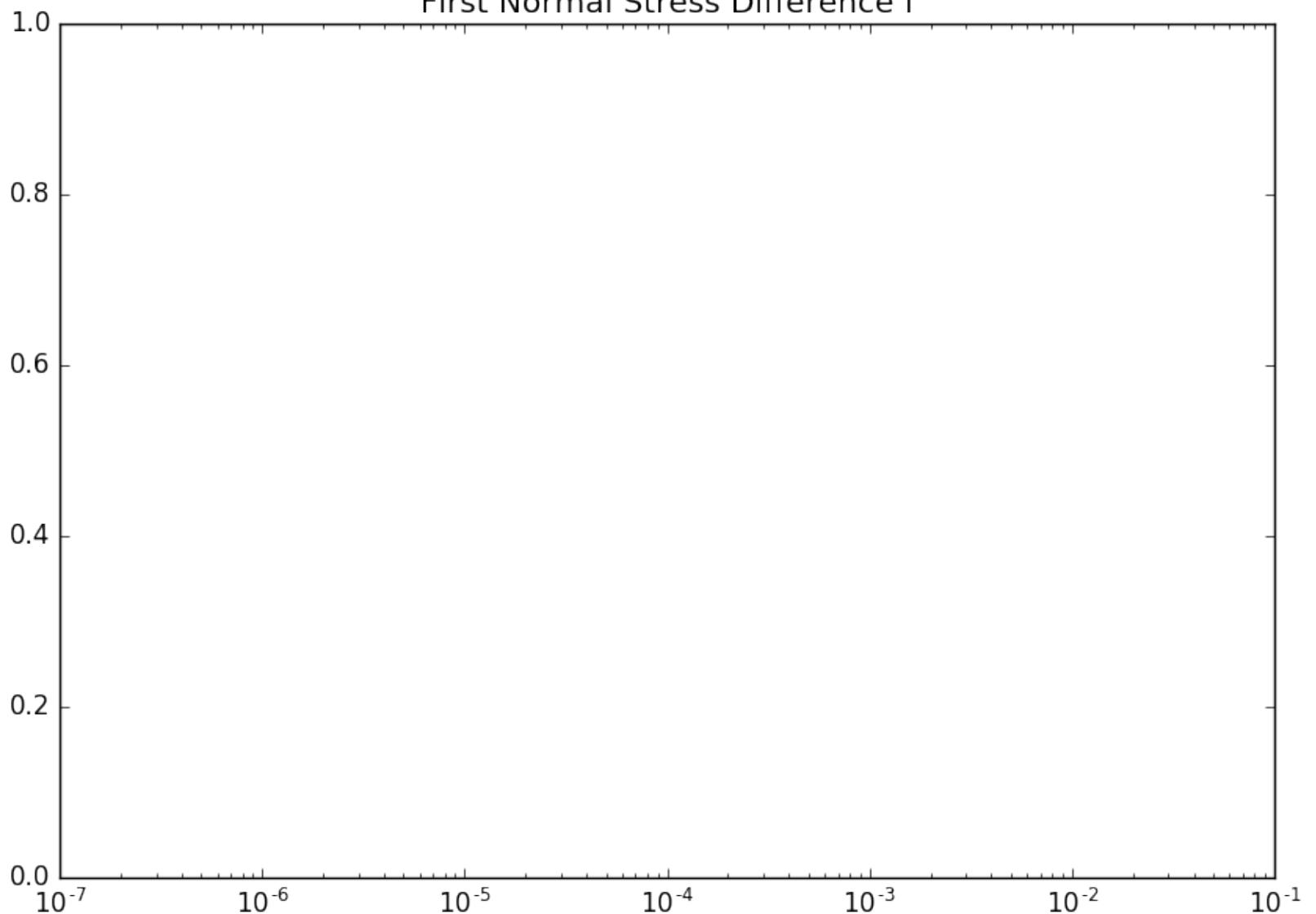
First Normal Stress Difference c



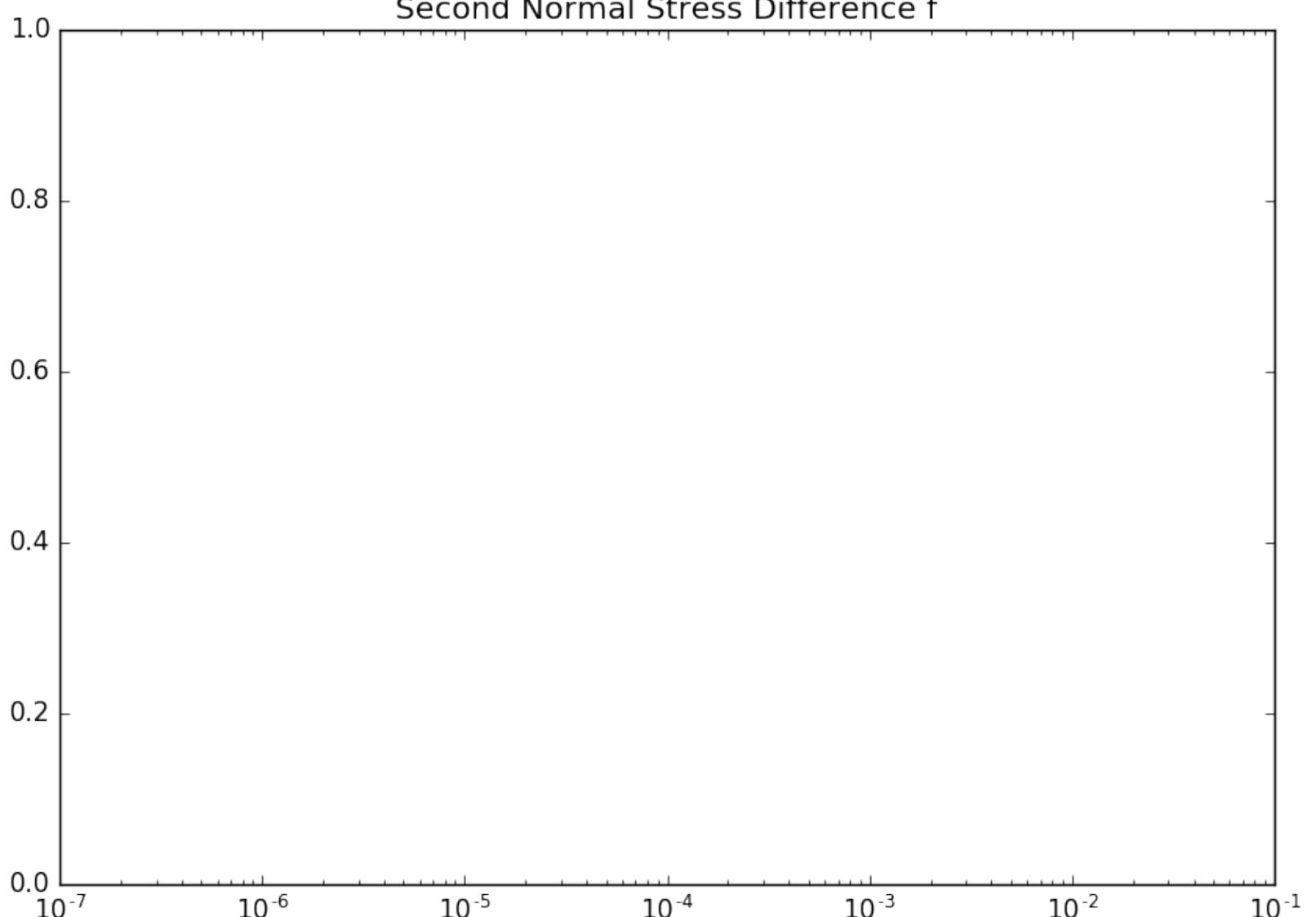
Second Normal Stress Difference c

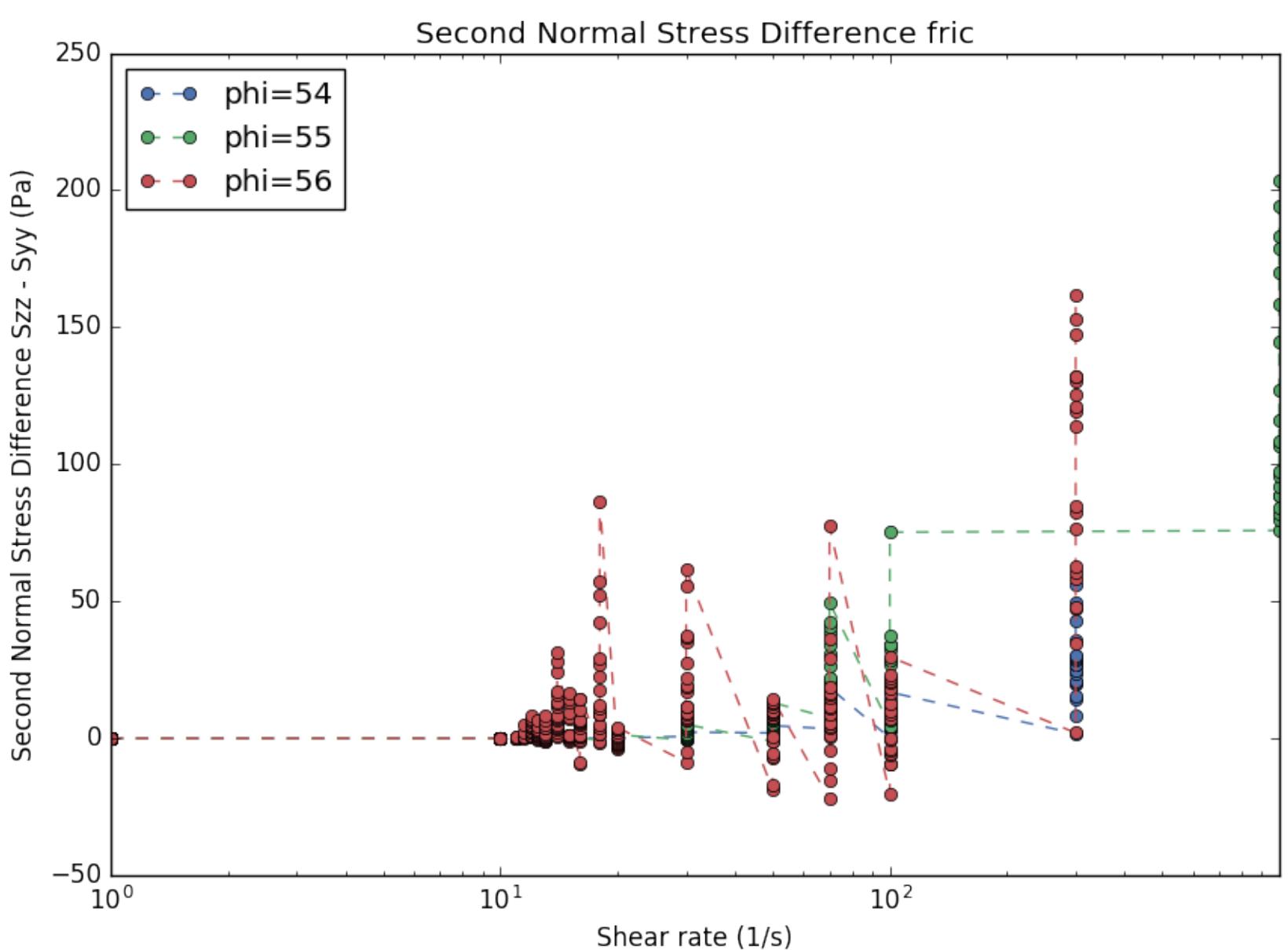
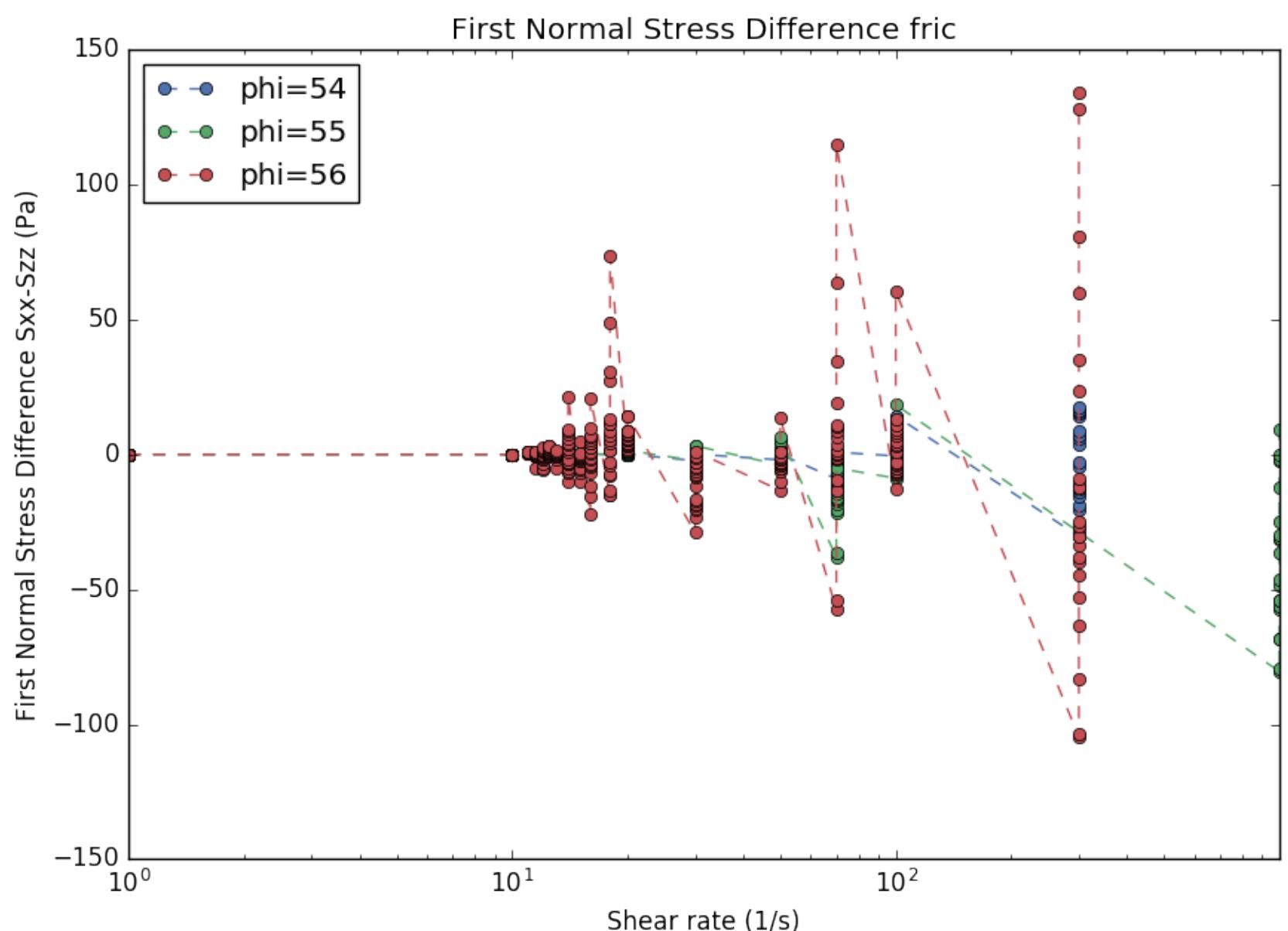


First Normal Stress Difference f

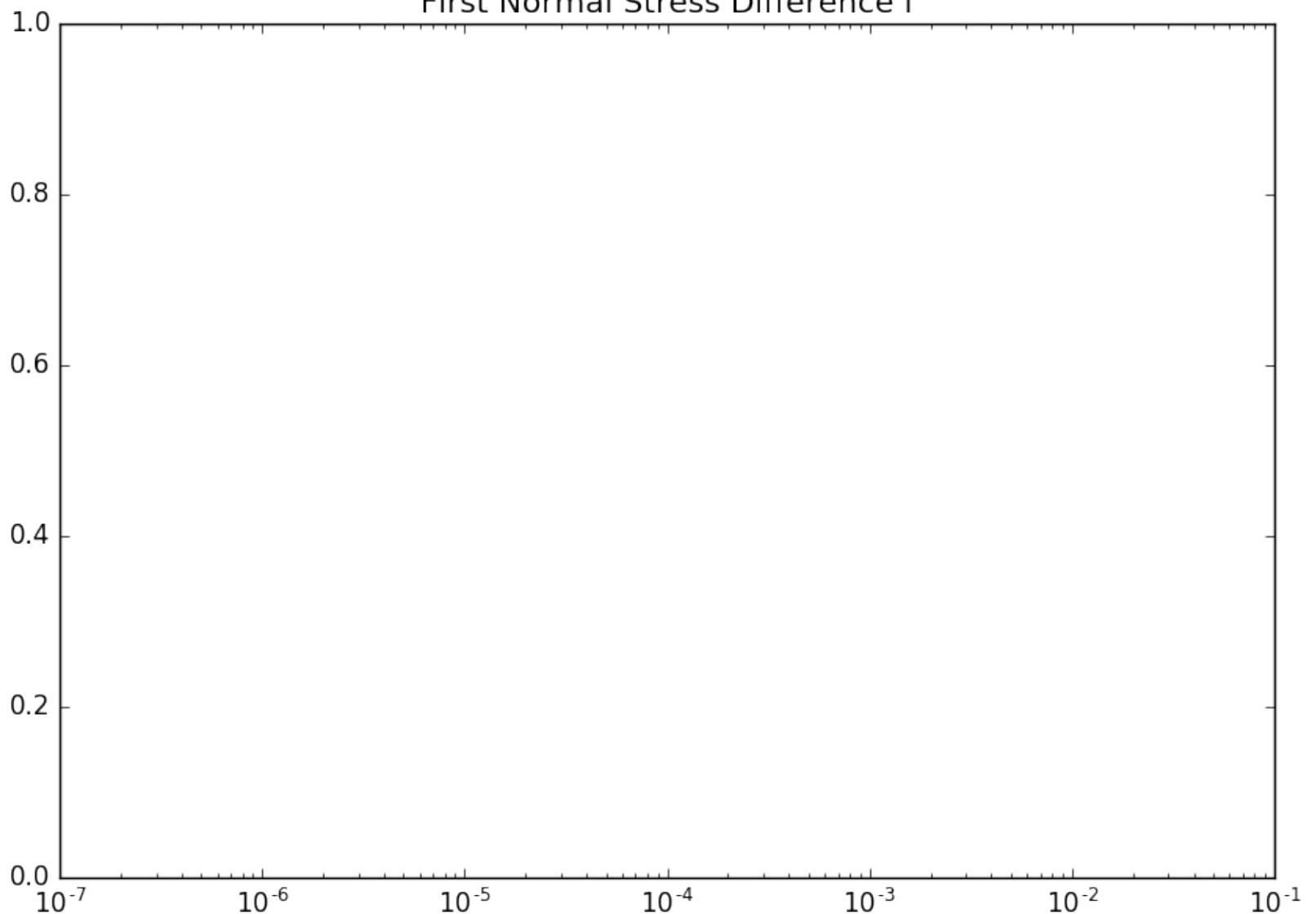


Second Normal Stress Difference f

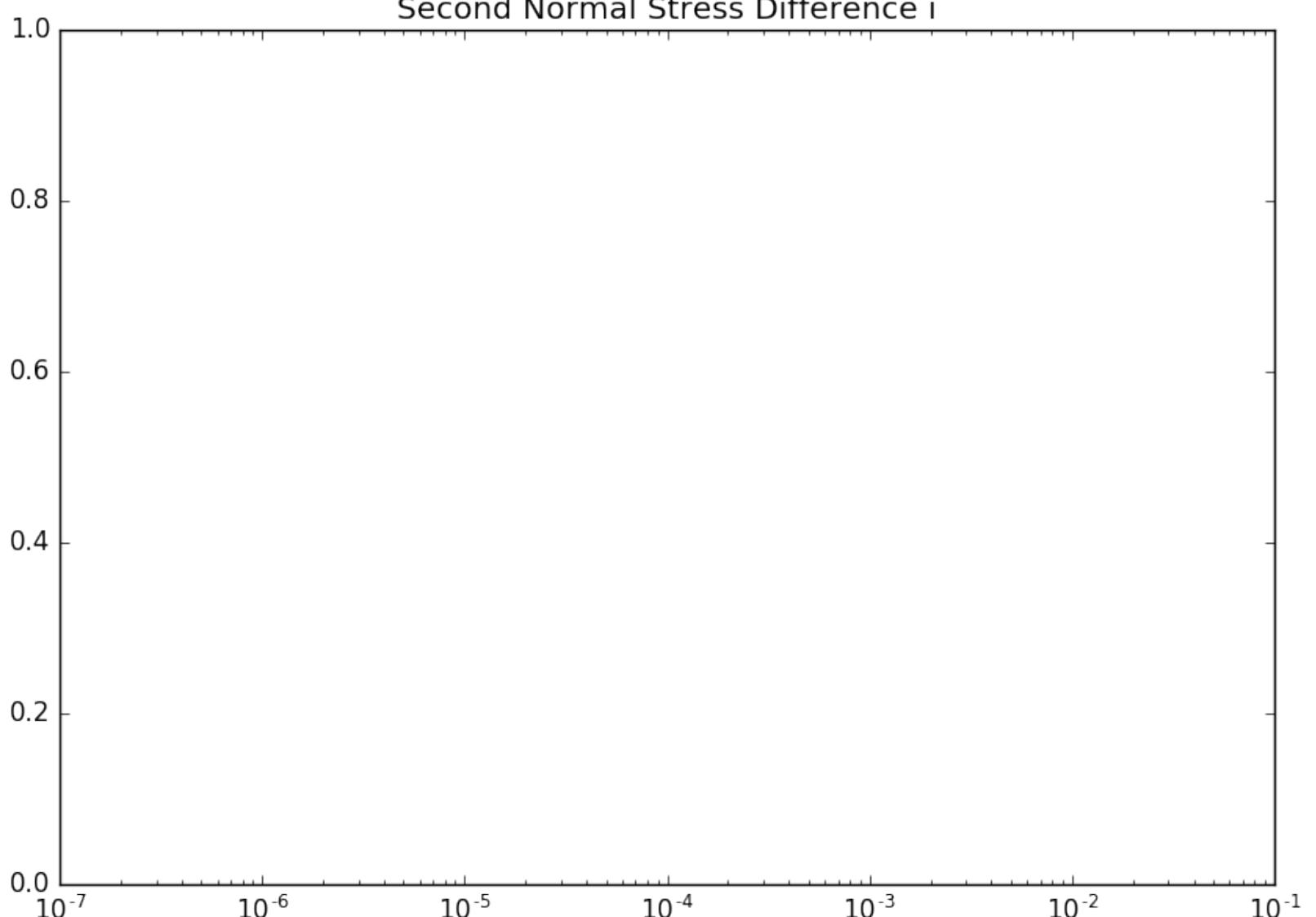


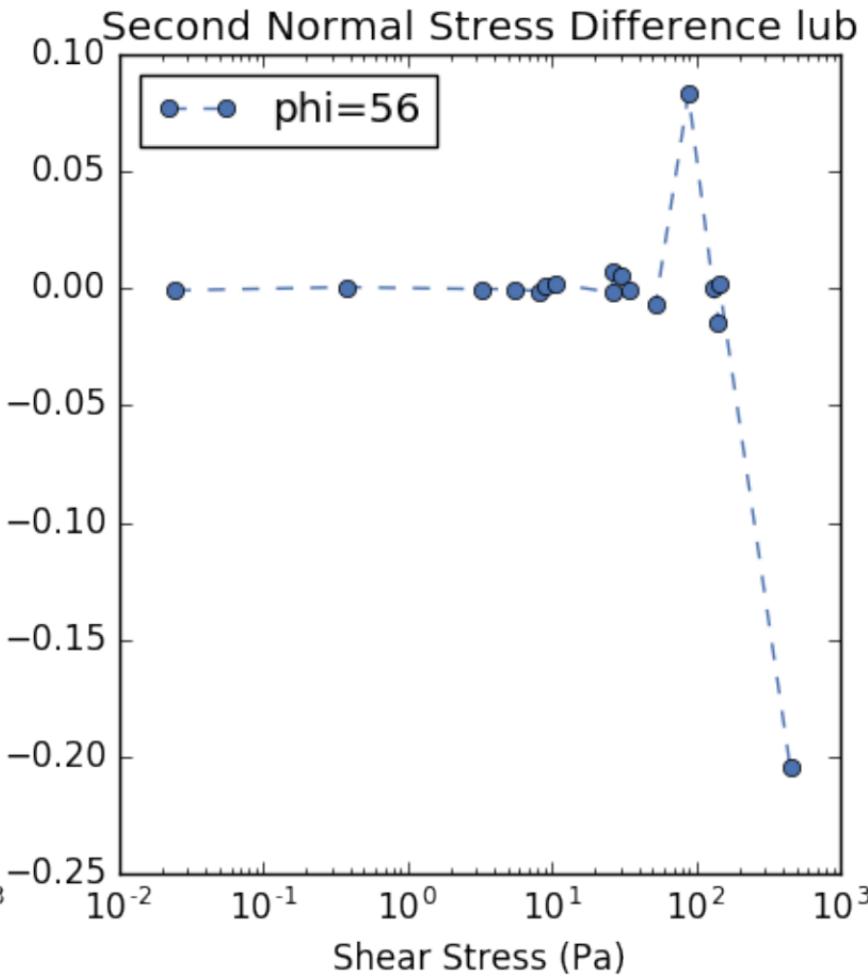
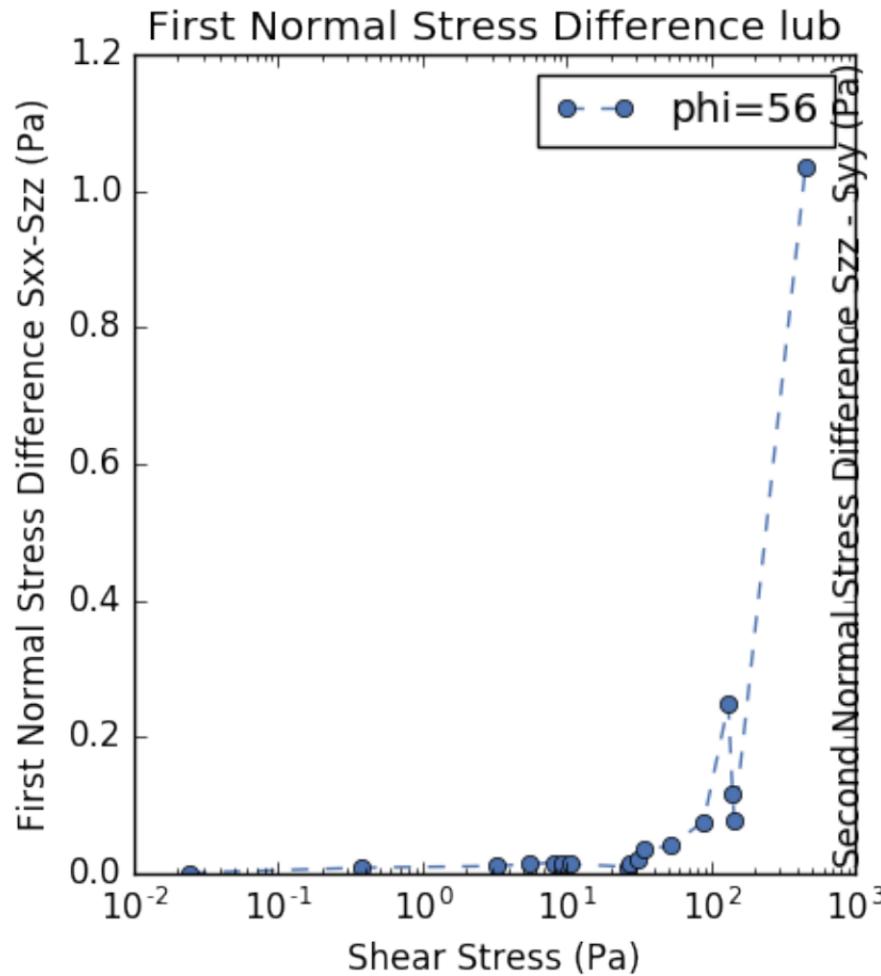


First Normal Stress Difference i

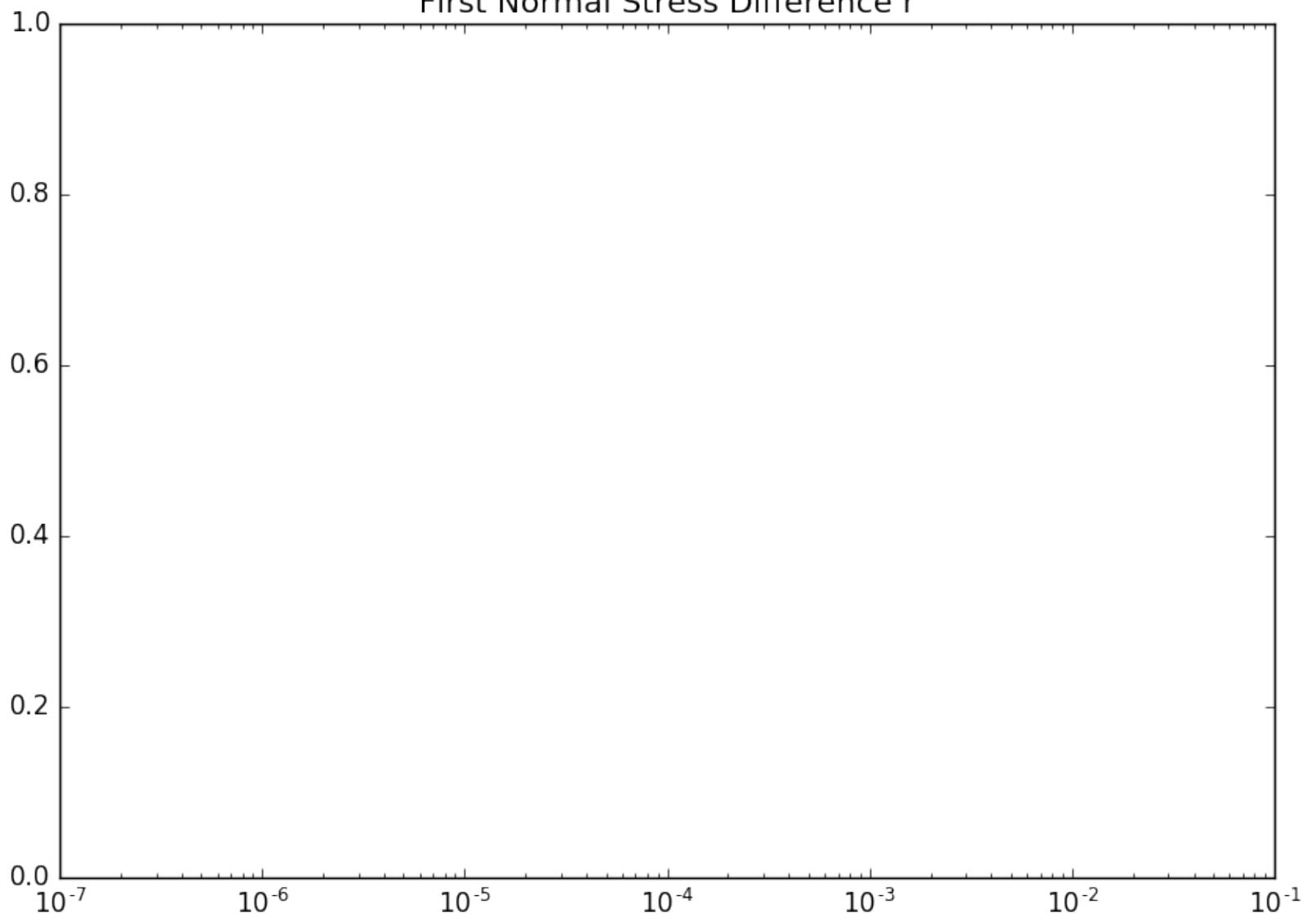


Second Normal Stress Difference i

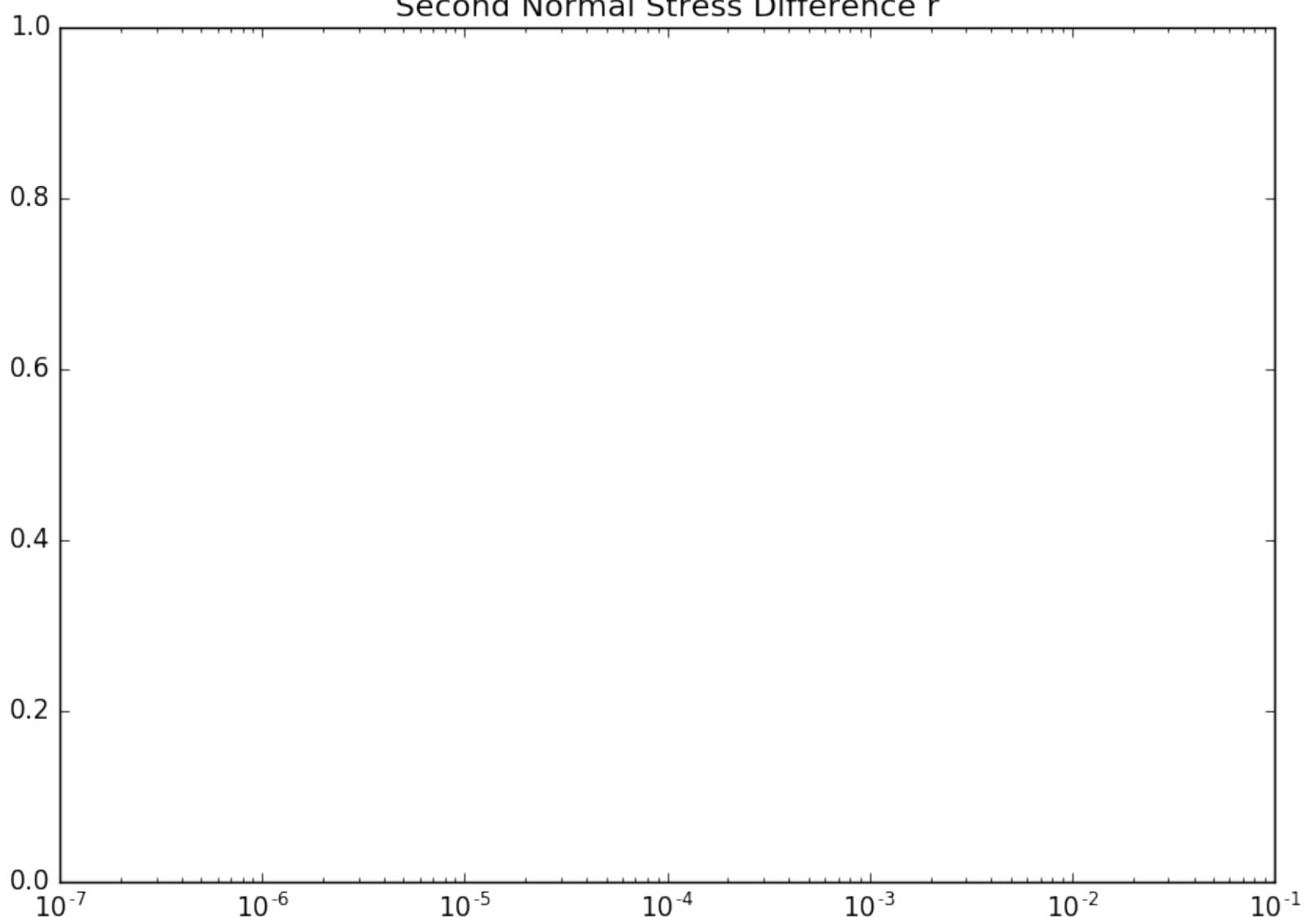


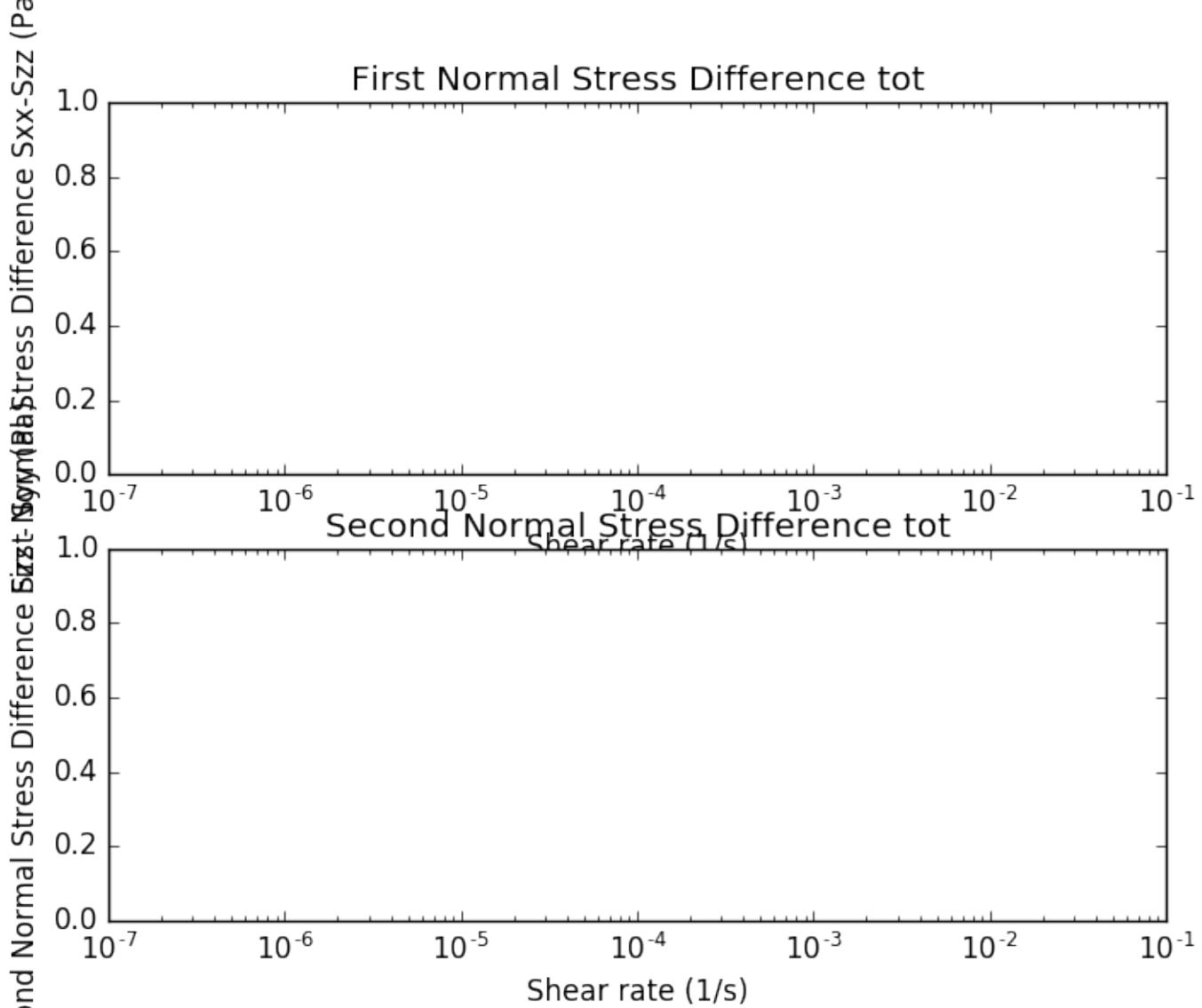


First Normal Stress Difference r

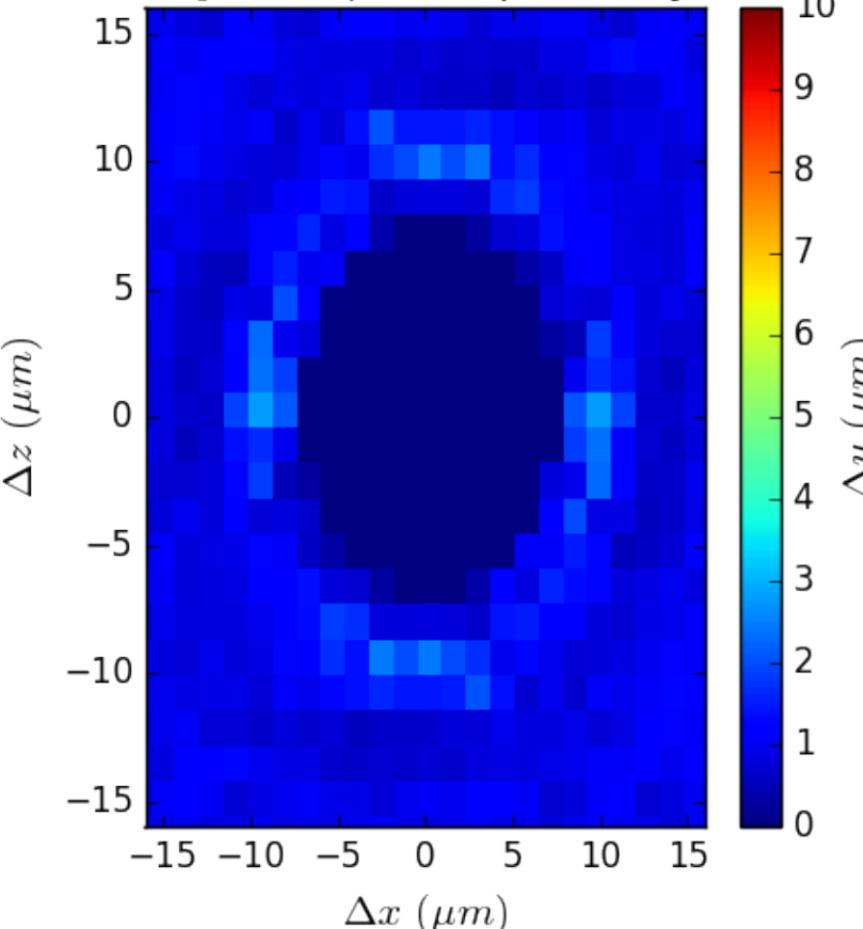


Second Normal Stress Difference r

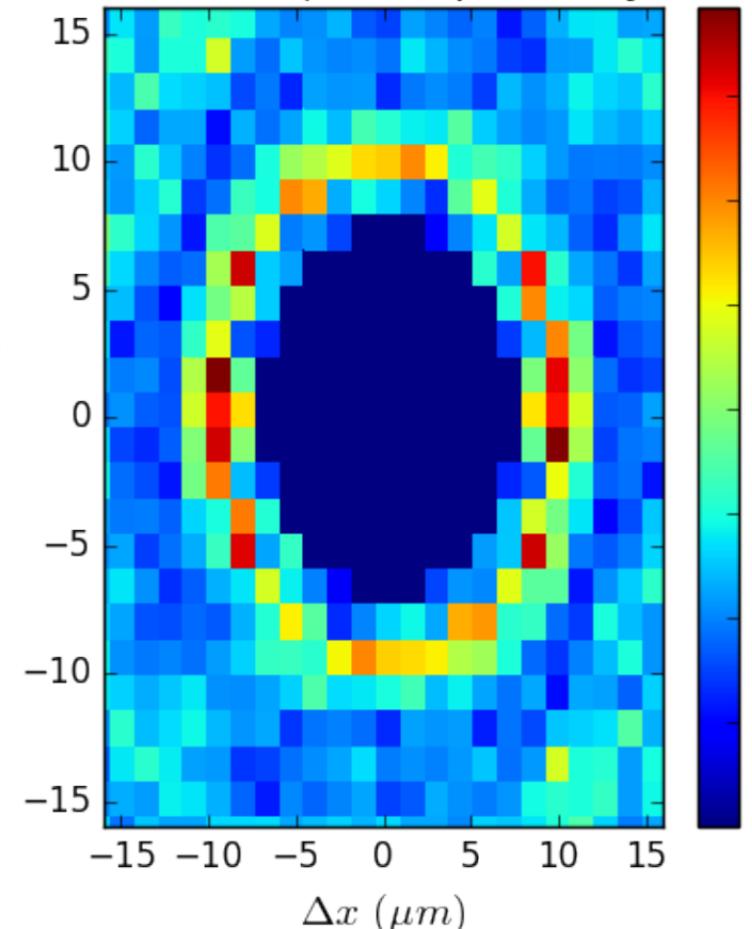




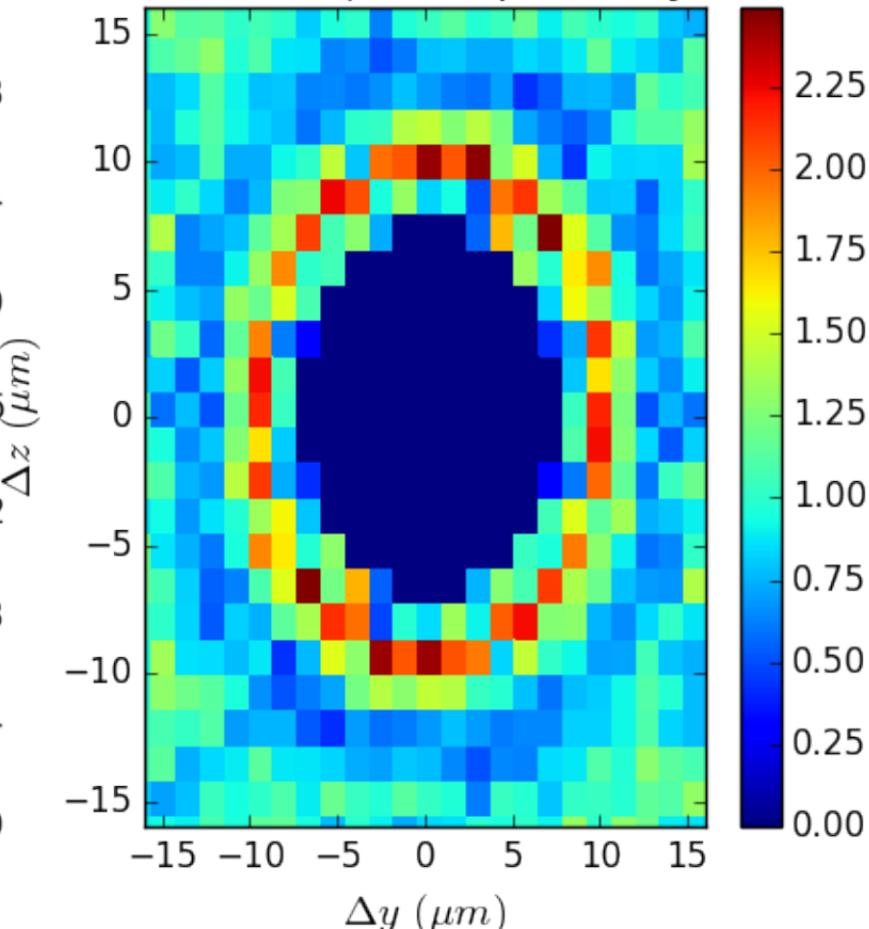
PDF at  $y = 1.38\mu m$  for  $\phi = 54$   $y_d = 50$



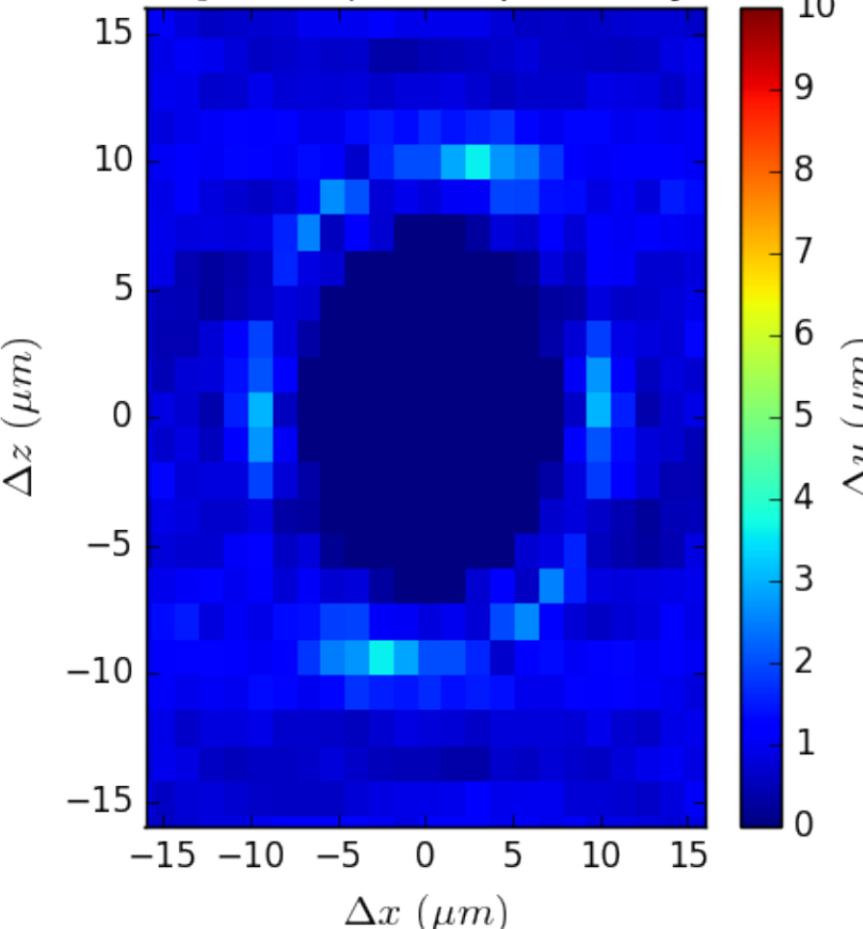
PDF at  $z = 1.38\mu m$  for  $\phi = 54$   $y_d = 50$



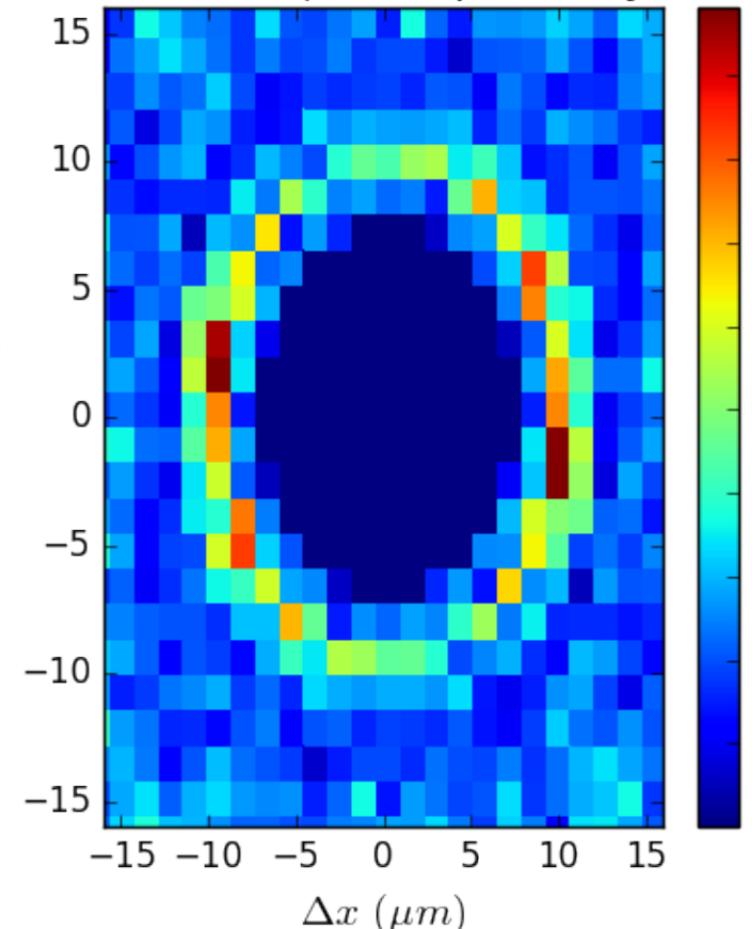
PDF at  $x = 1.38\mu m$  for  $\phi = 54$   $y_d = 50$



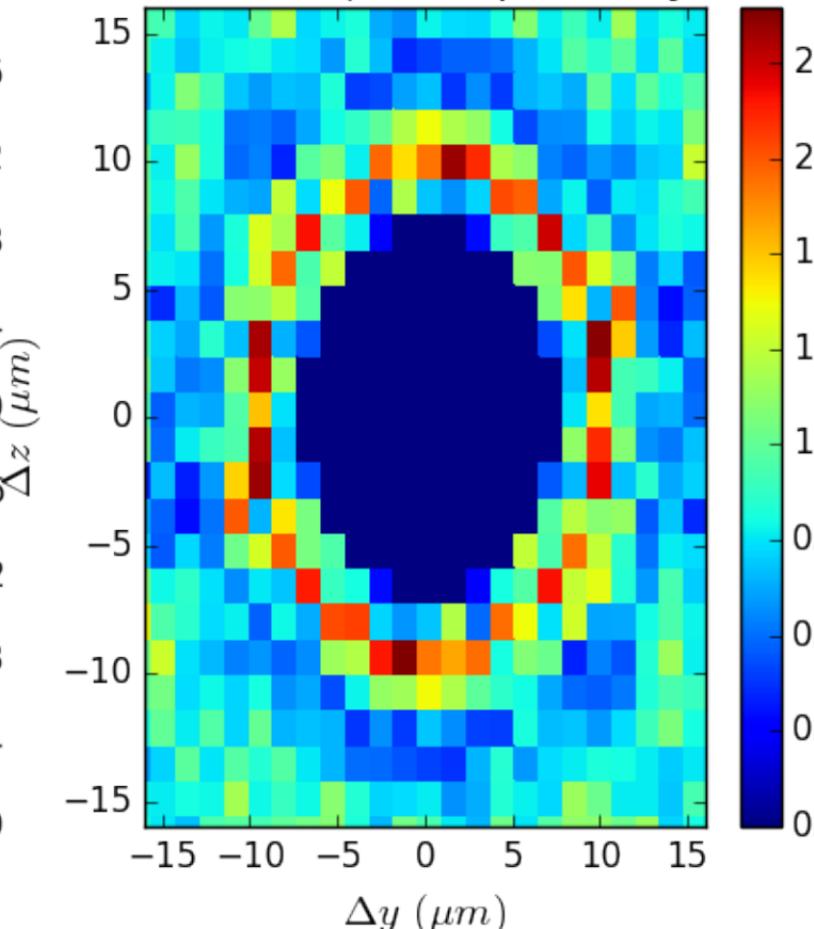
PDF at  $y = 1.38\mu m$  for  $\phi = 55$   $y_d = 10$

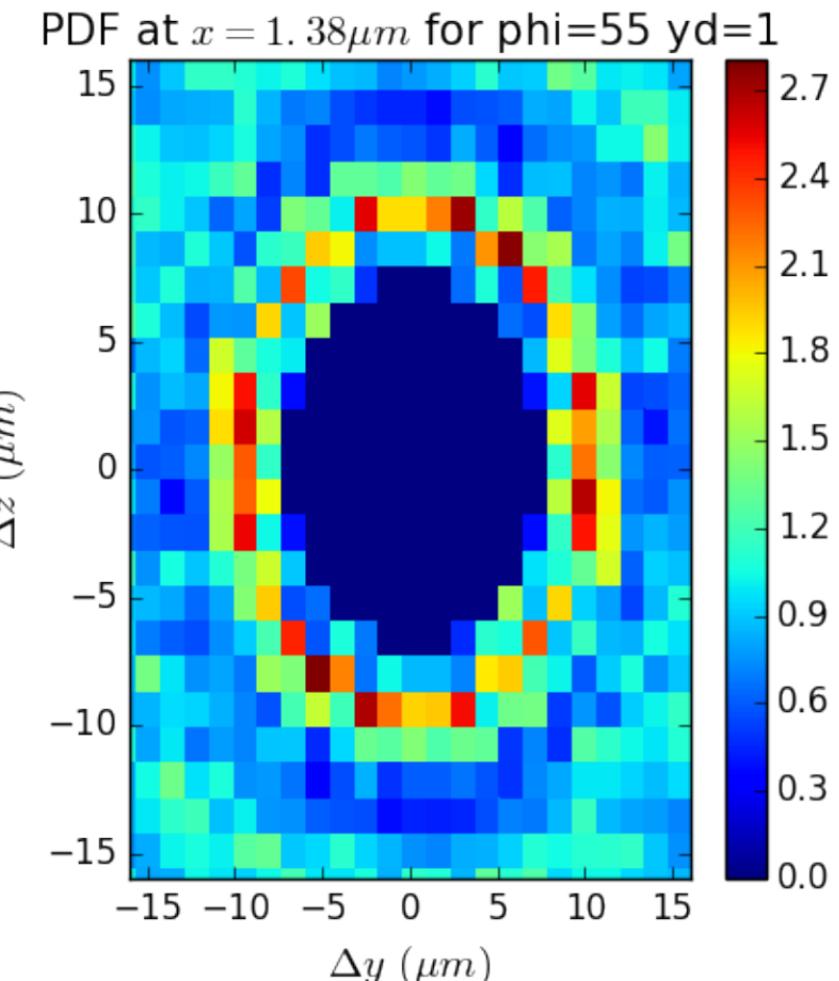
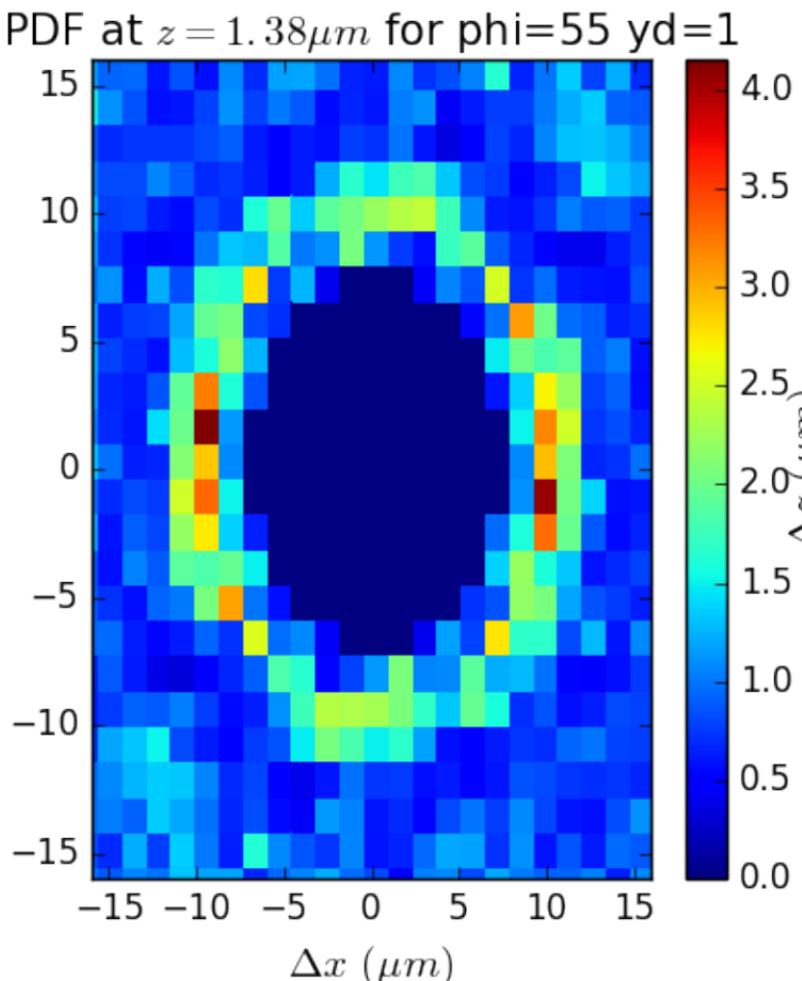
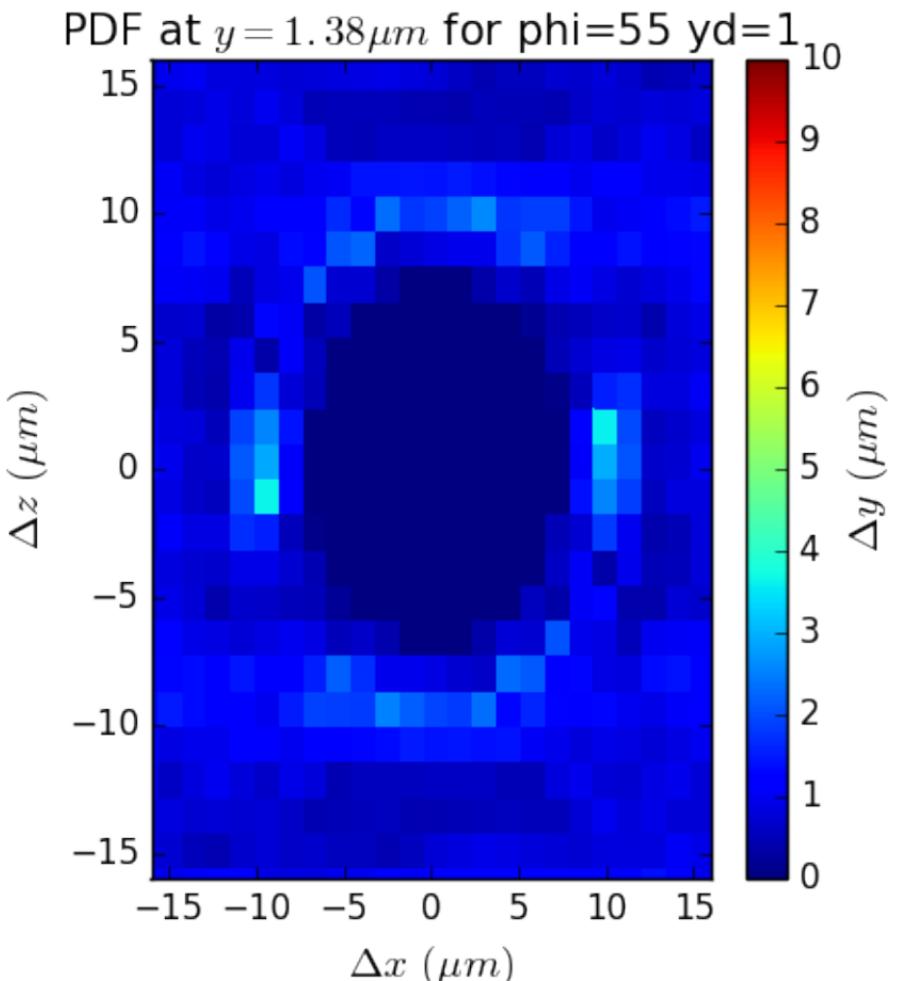


PDF at  $z = 1.38\mu m$  for  $\phi = 55$   $y_d = 10$

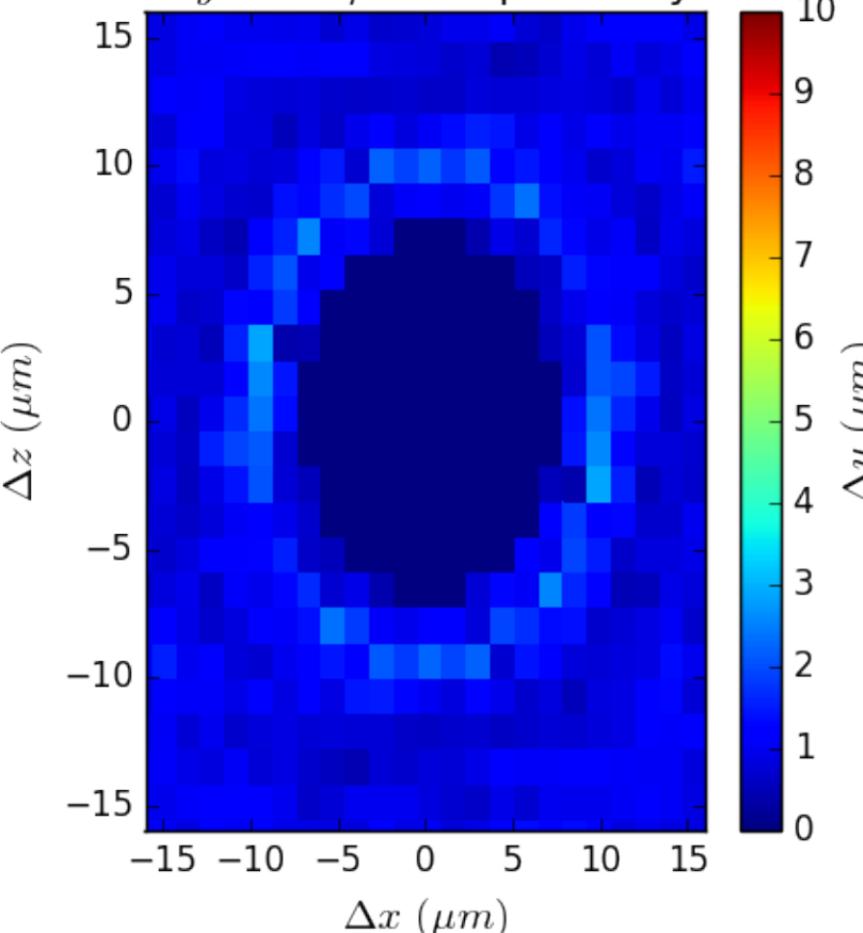


PDF at  $x = 1.38\mu m$  for  $\phi = 55$   $y_d = 10$

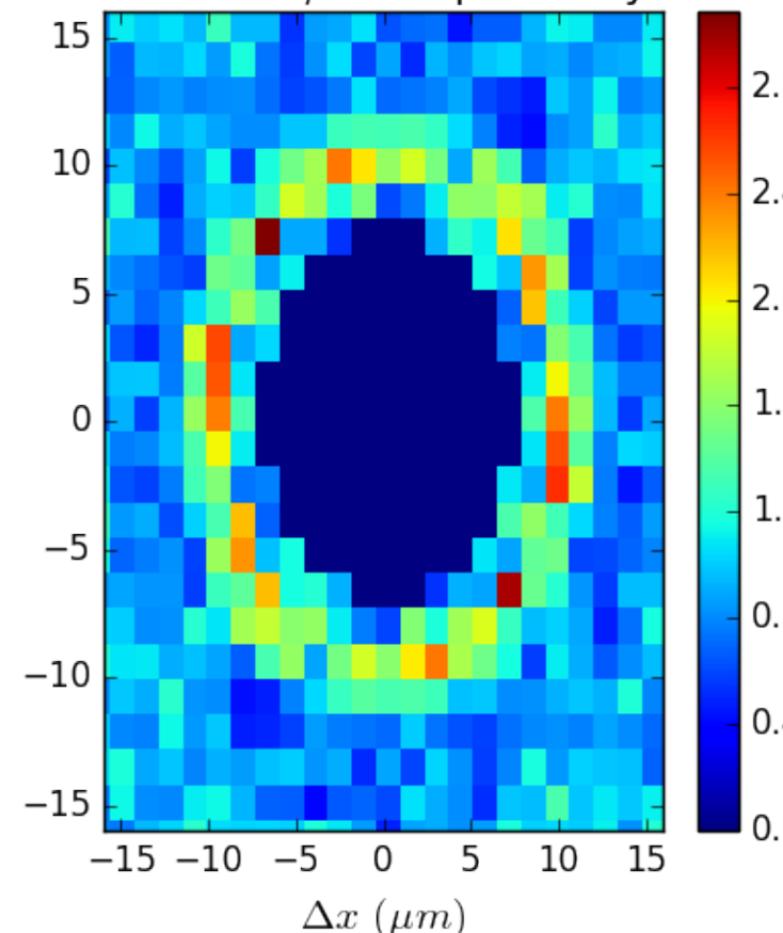




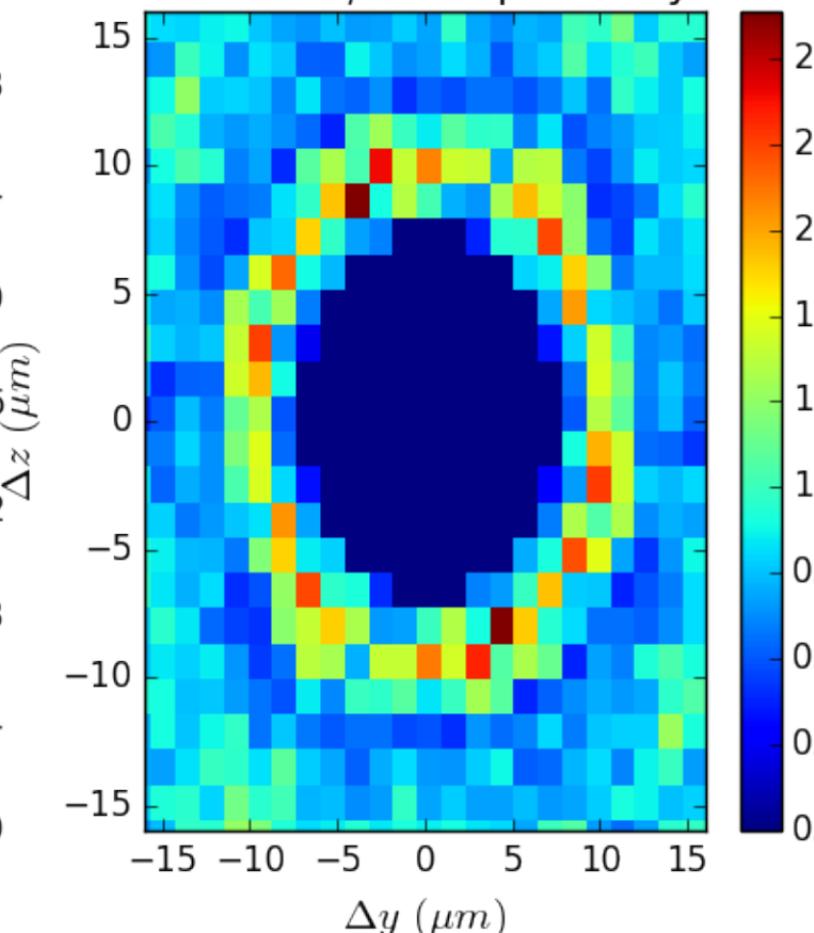
PDF at  $y = 1.38\mu m$  for  $\phi = 55$   $y_d = 70$

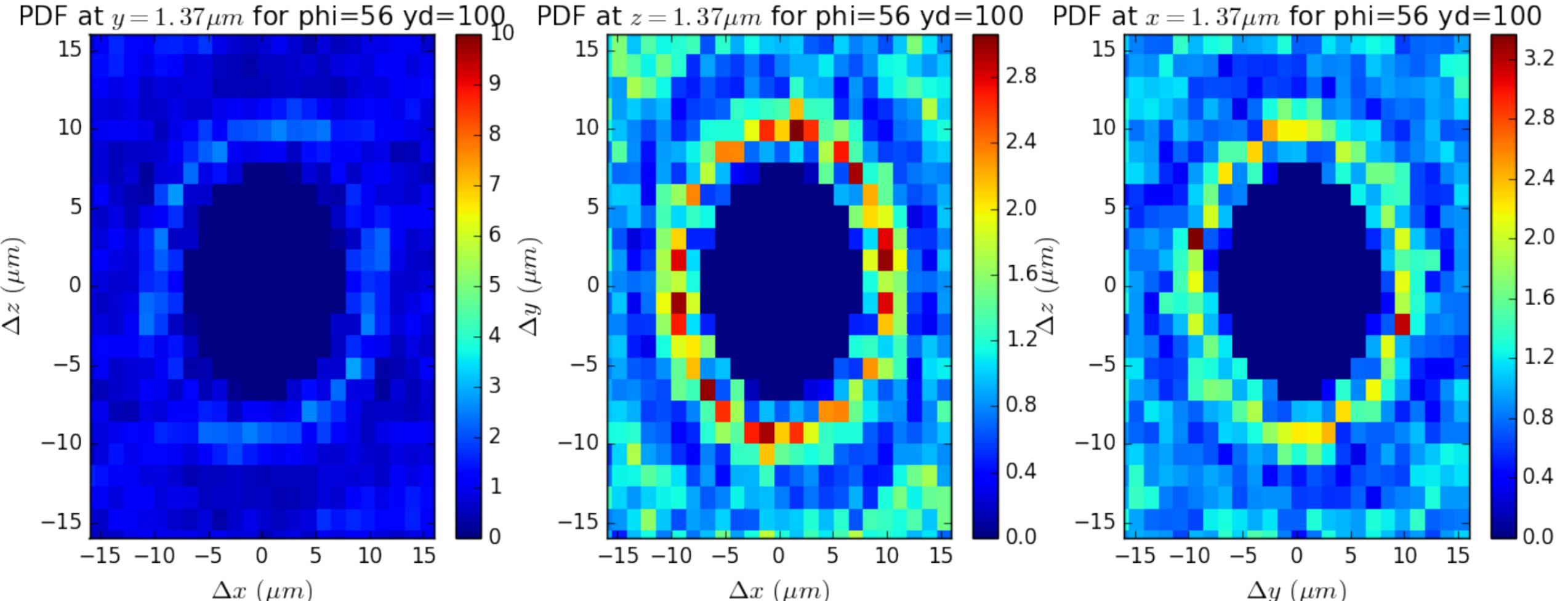


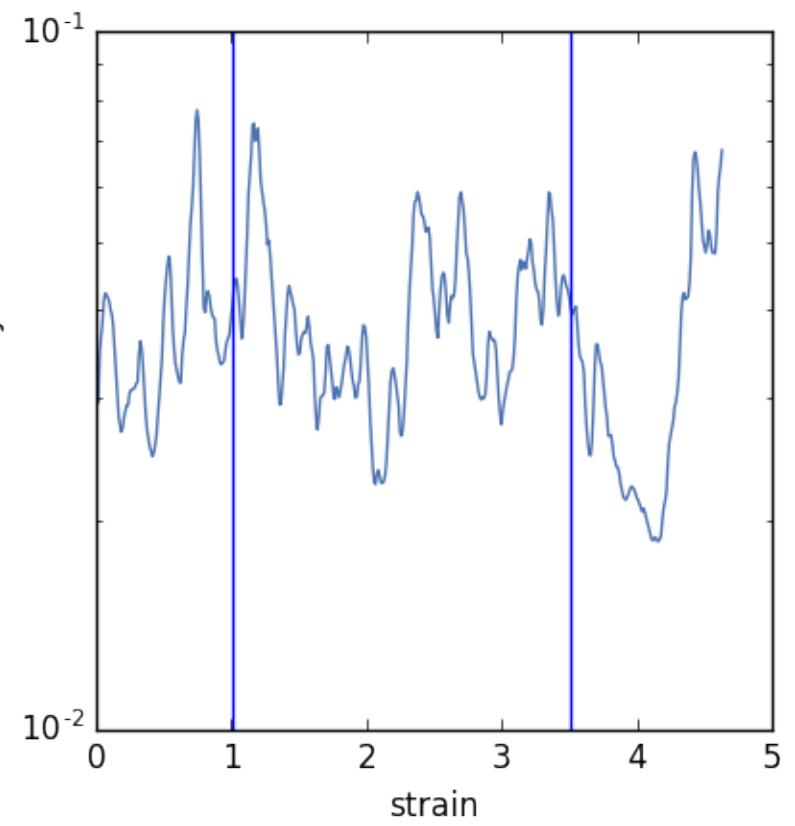
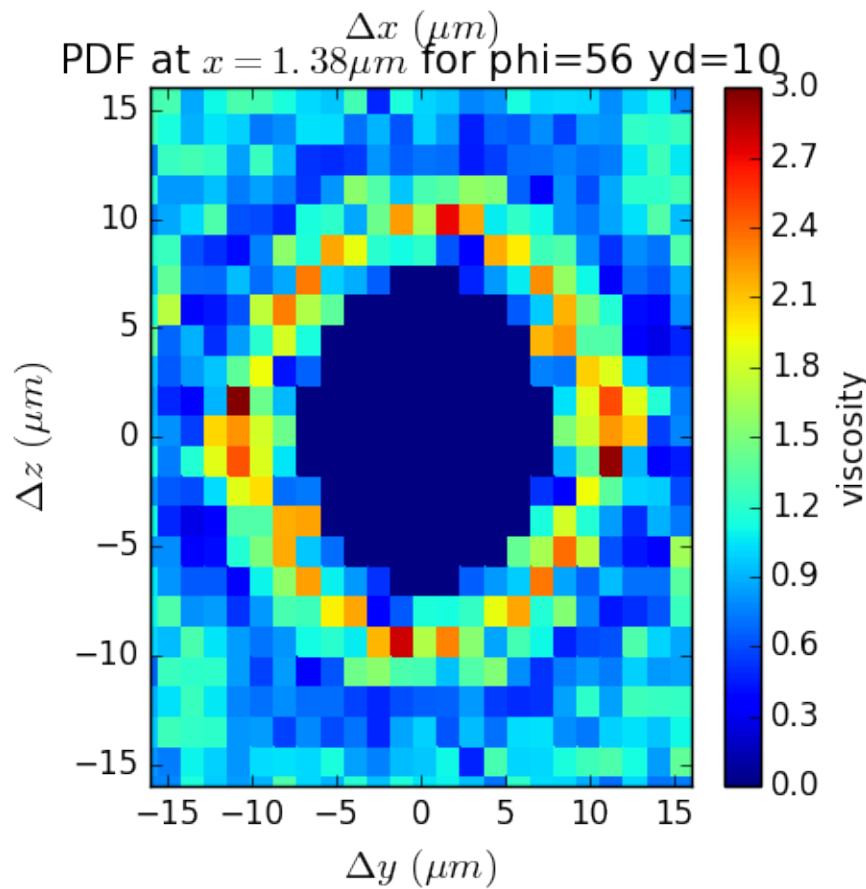
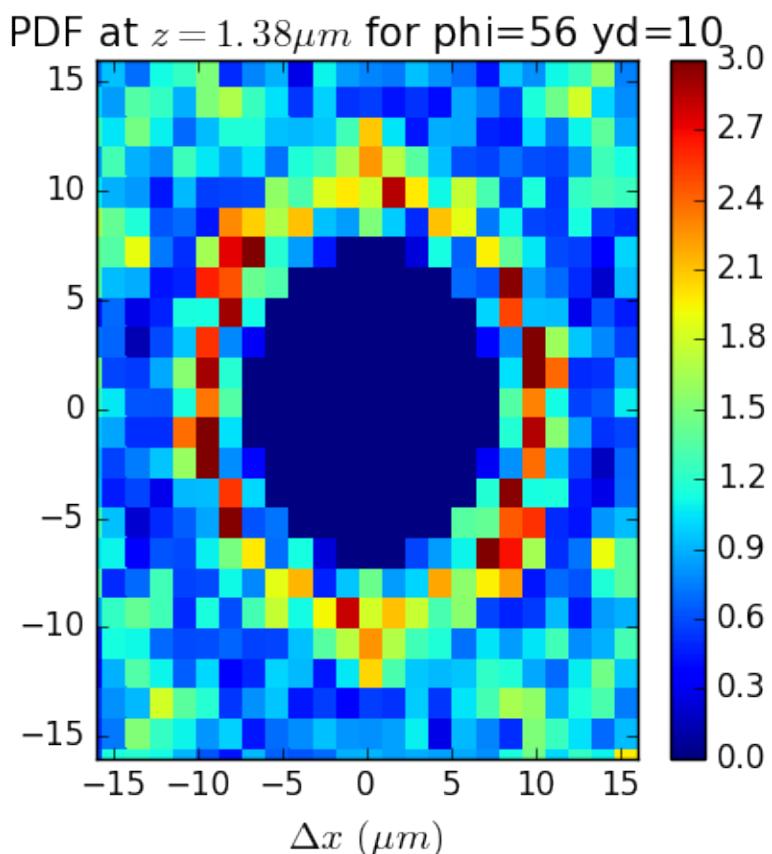
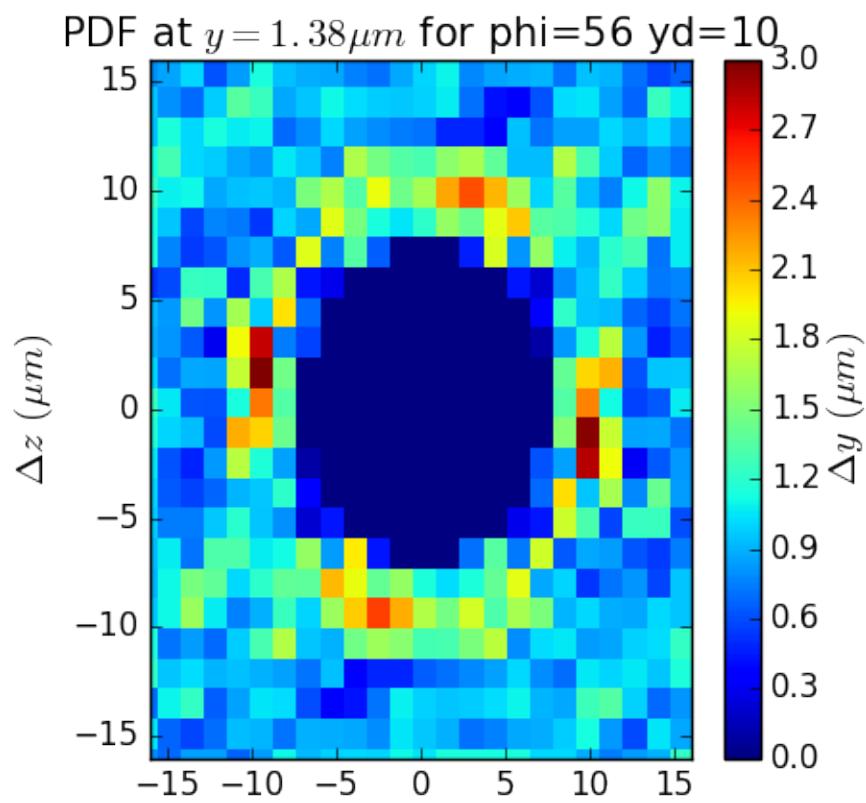
PDF at  $z = 1.38\mu m$  for  $\phi = 55$   $y_d = 70$

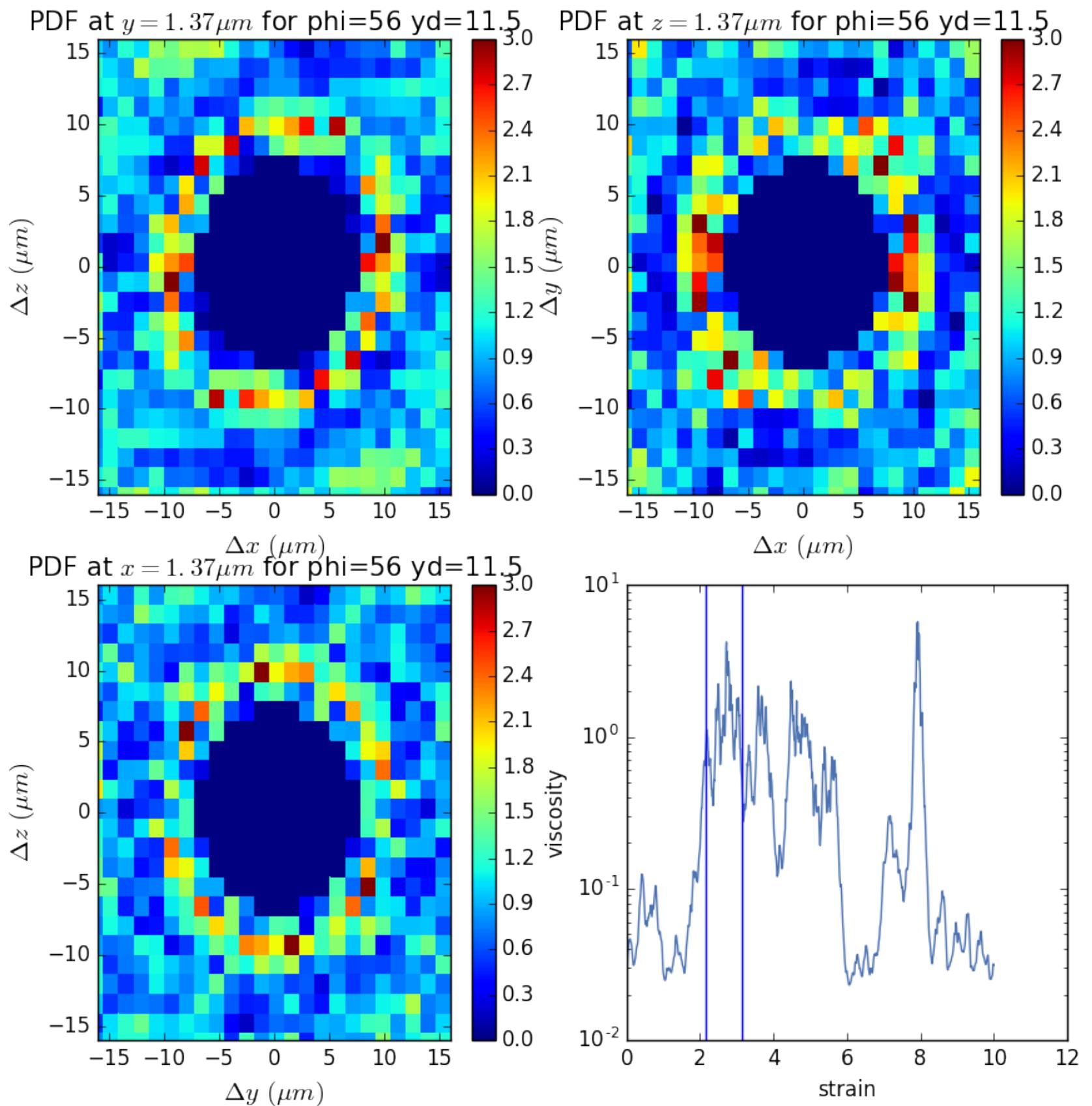


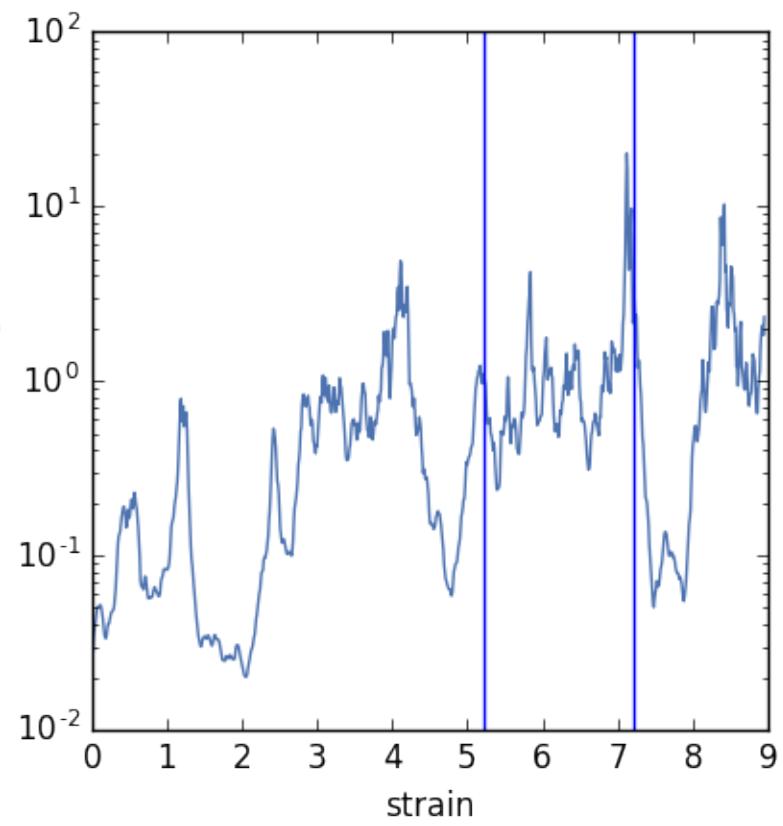
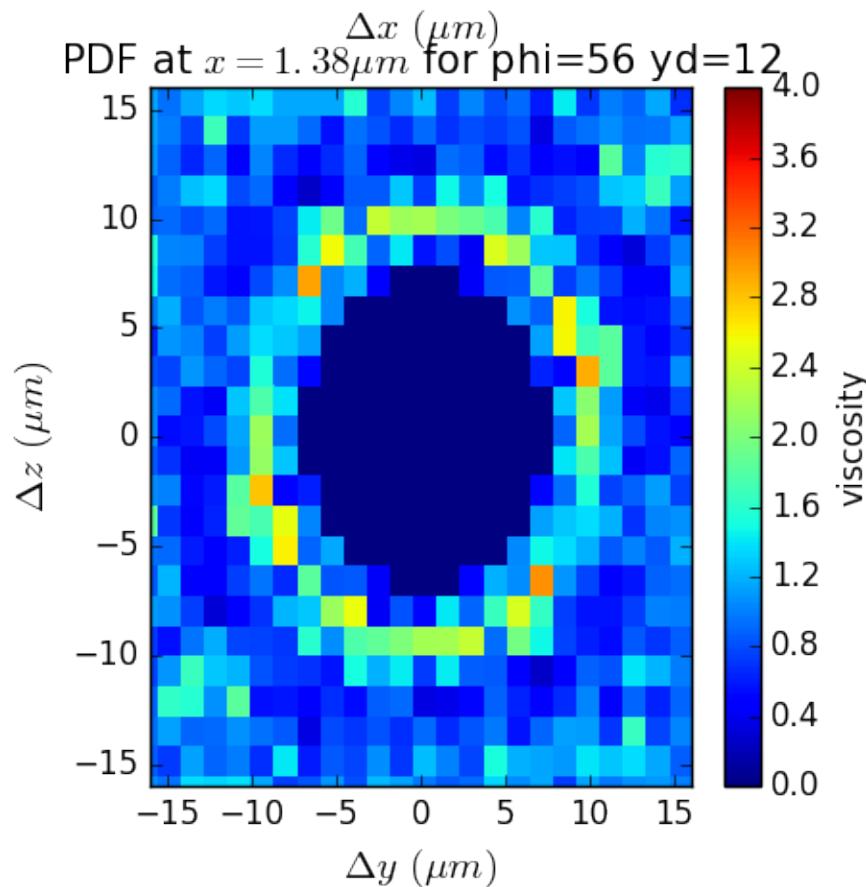
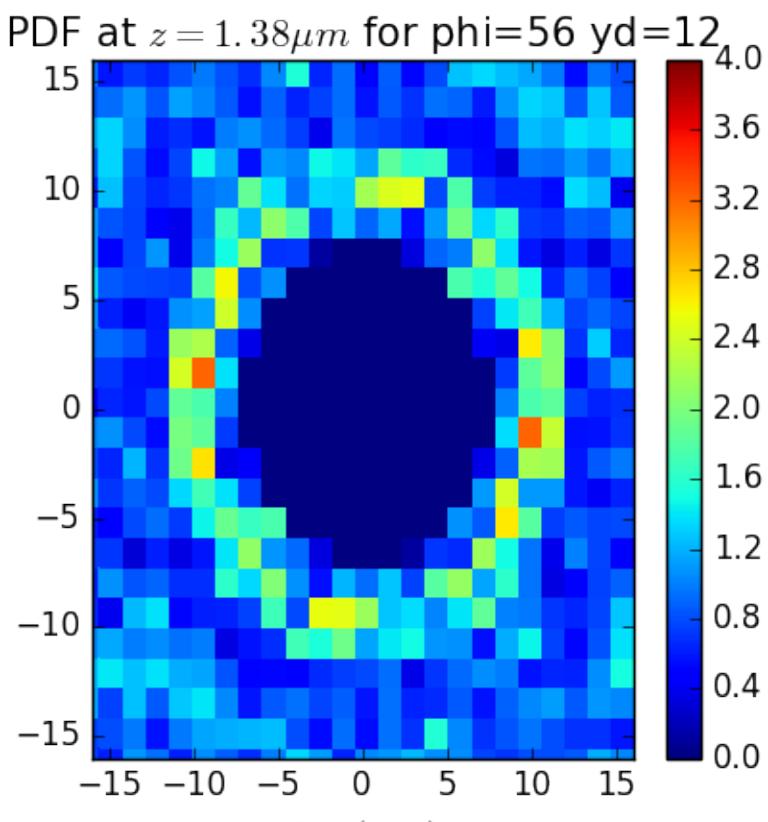
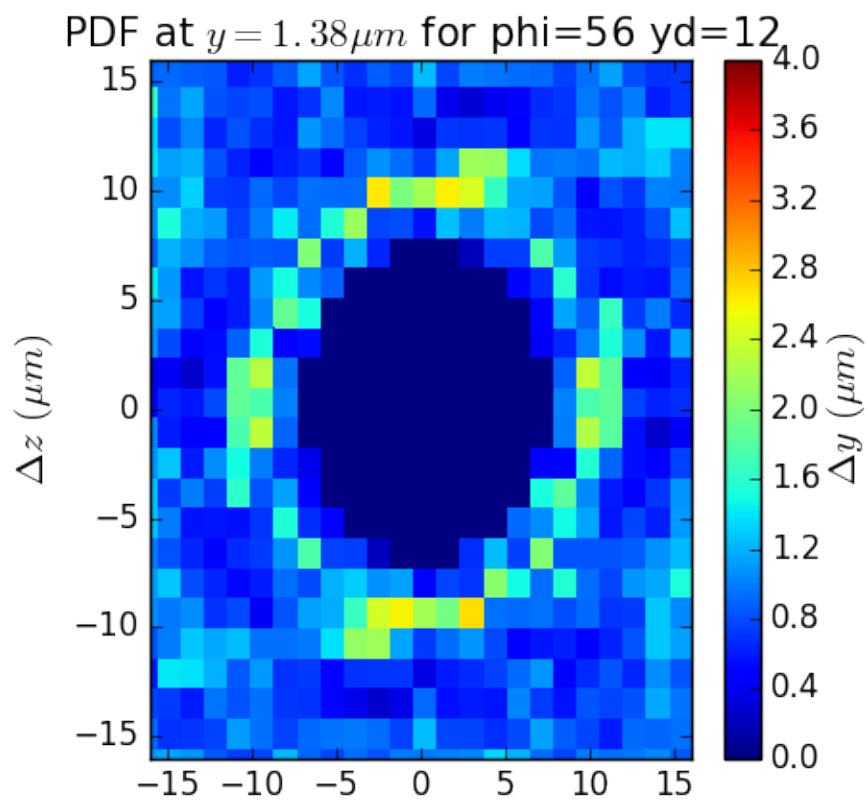
PDF at  $x = 1.38\mu m$  for  $\phi = 55$   $y_d = 70$

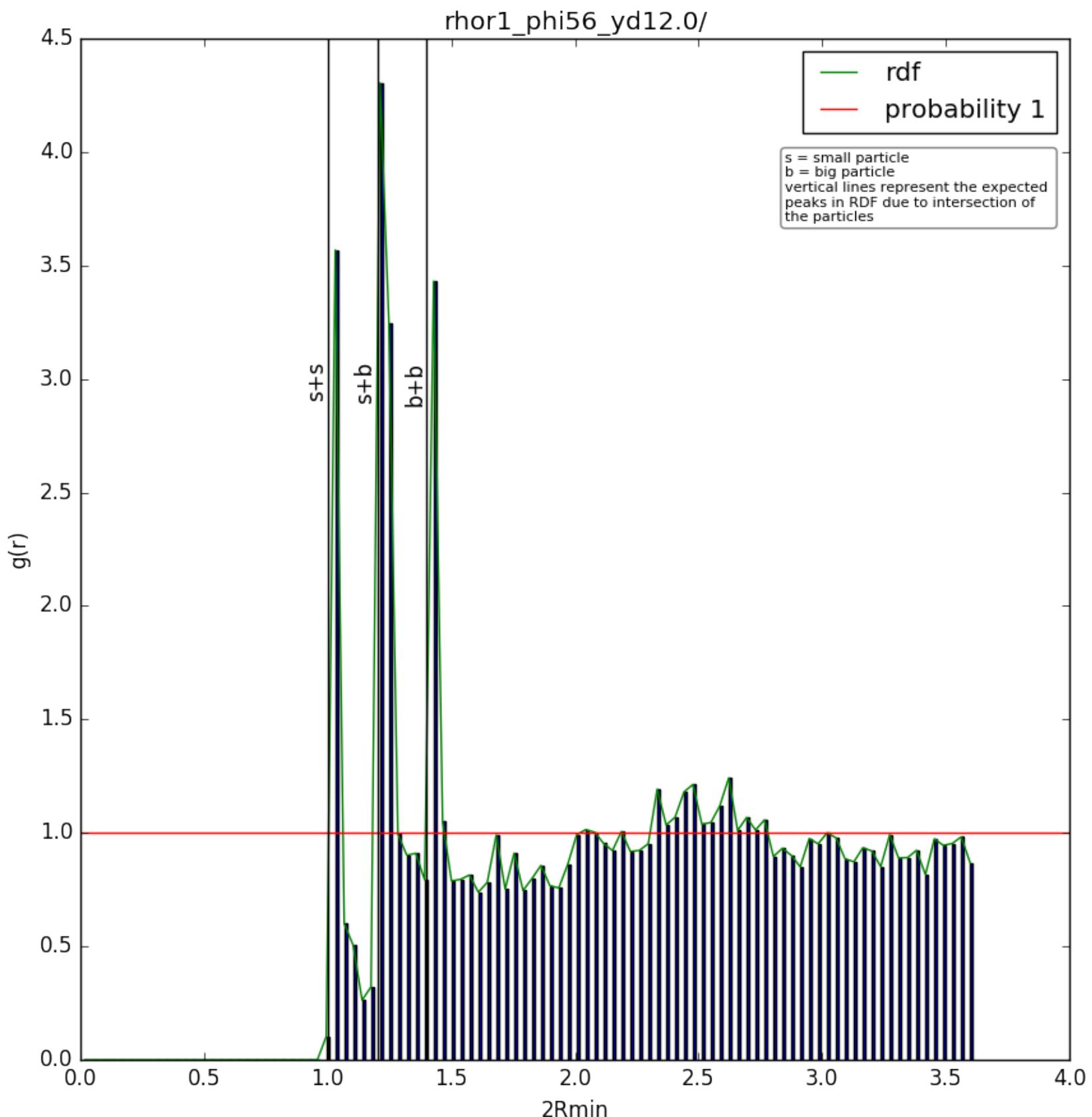


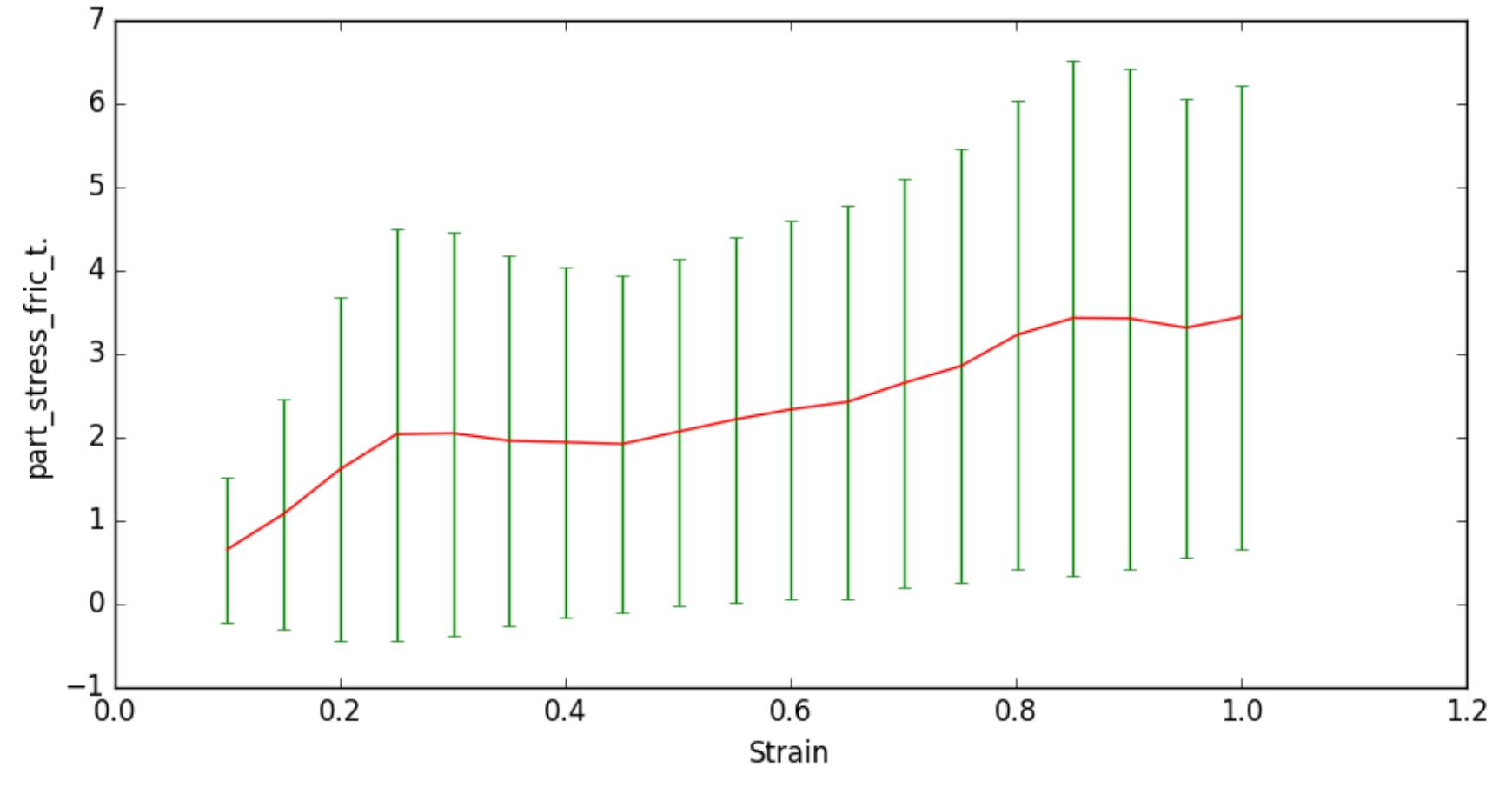
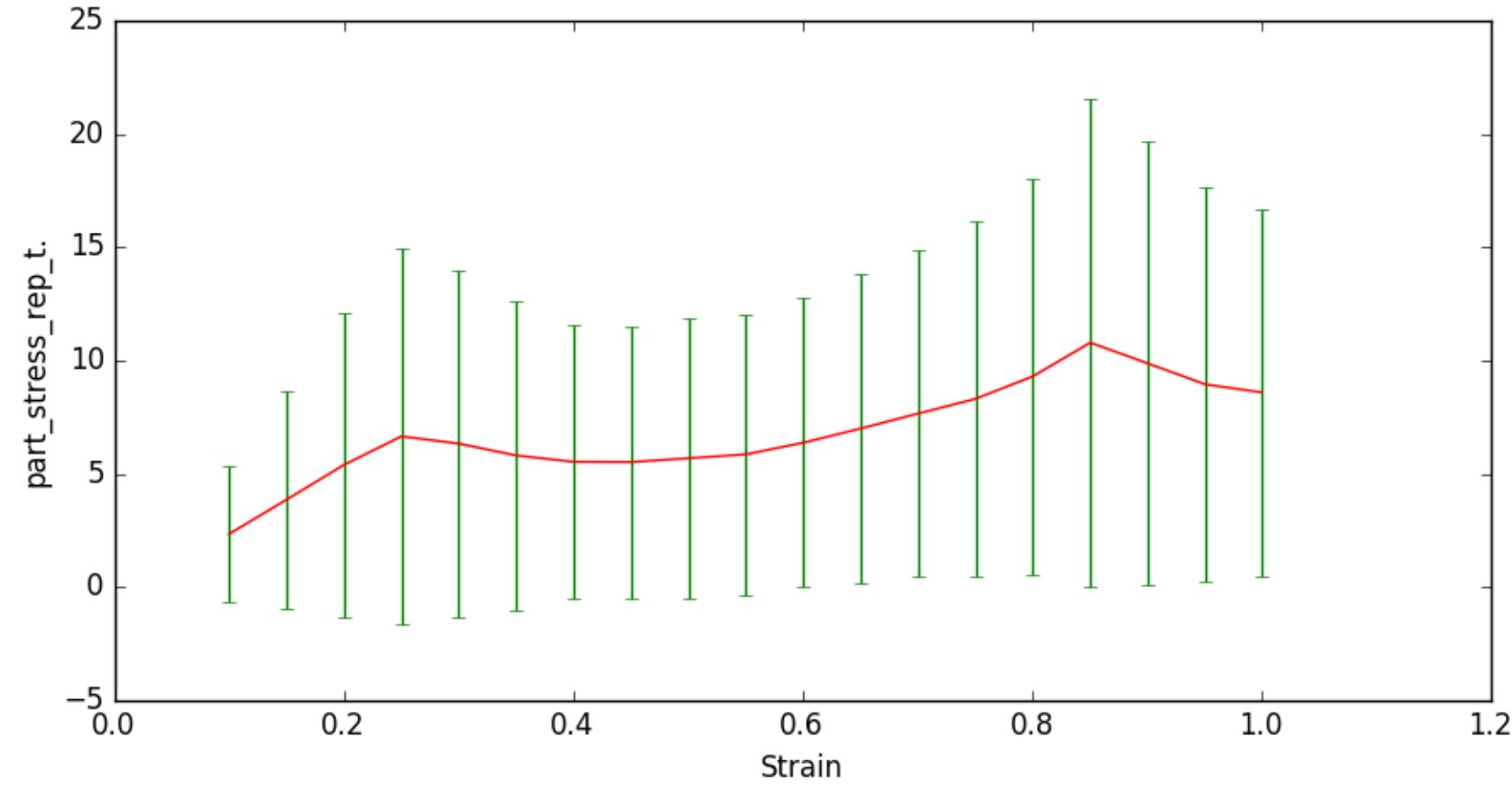
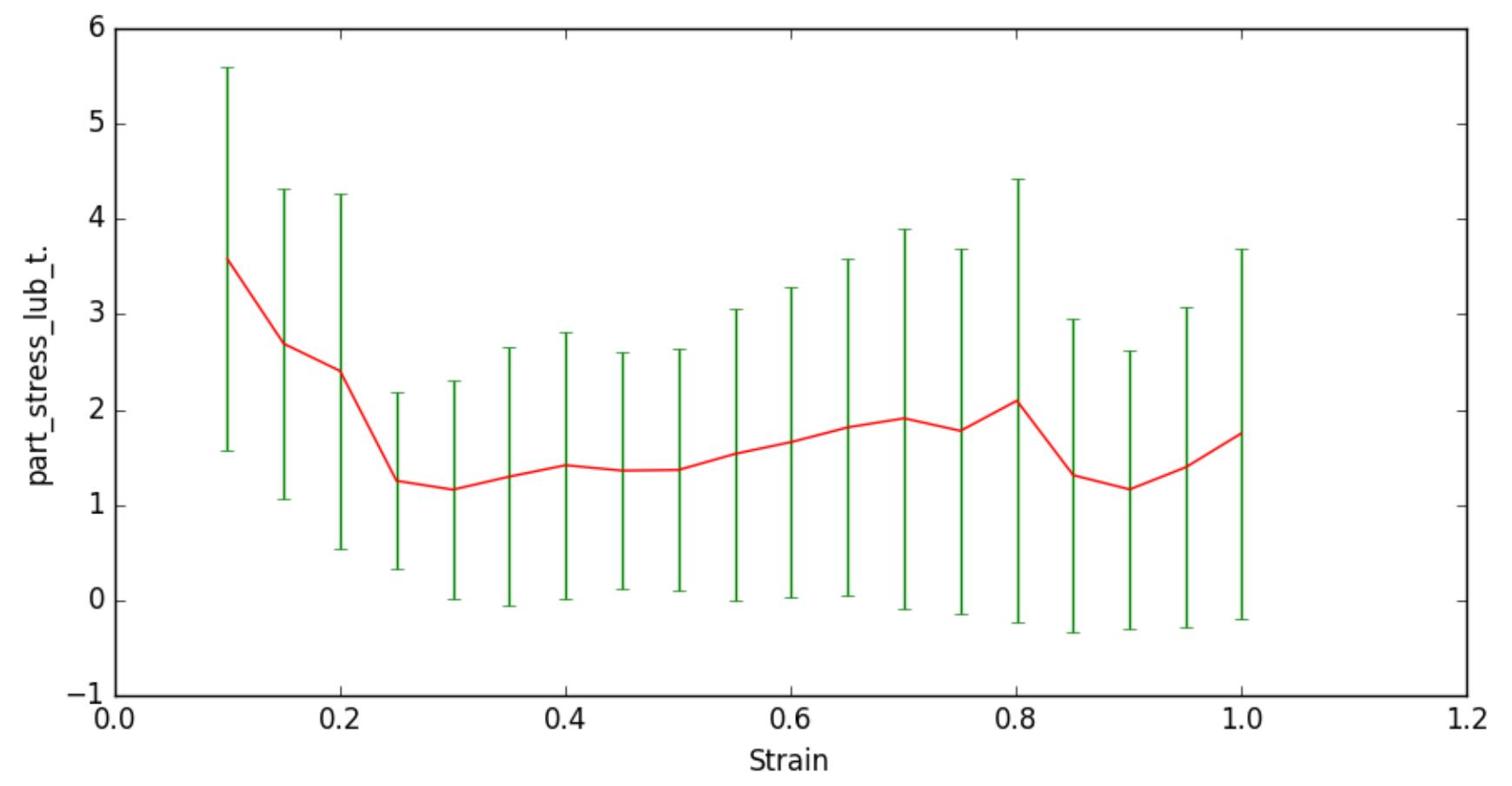
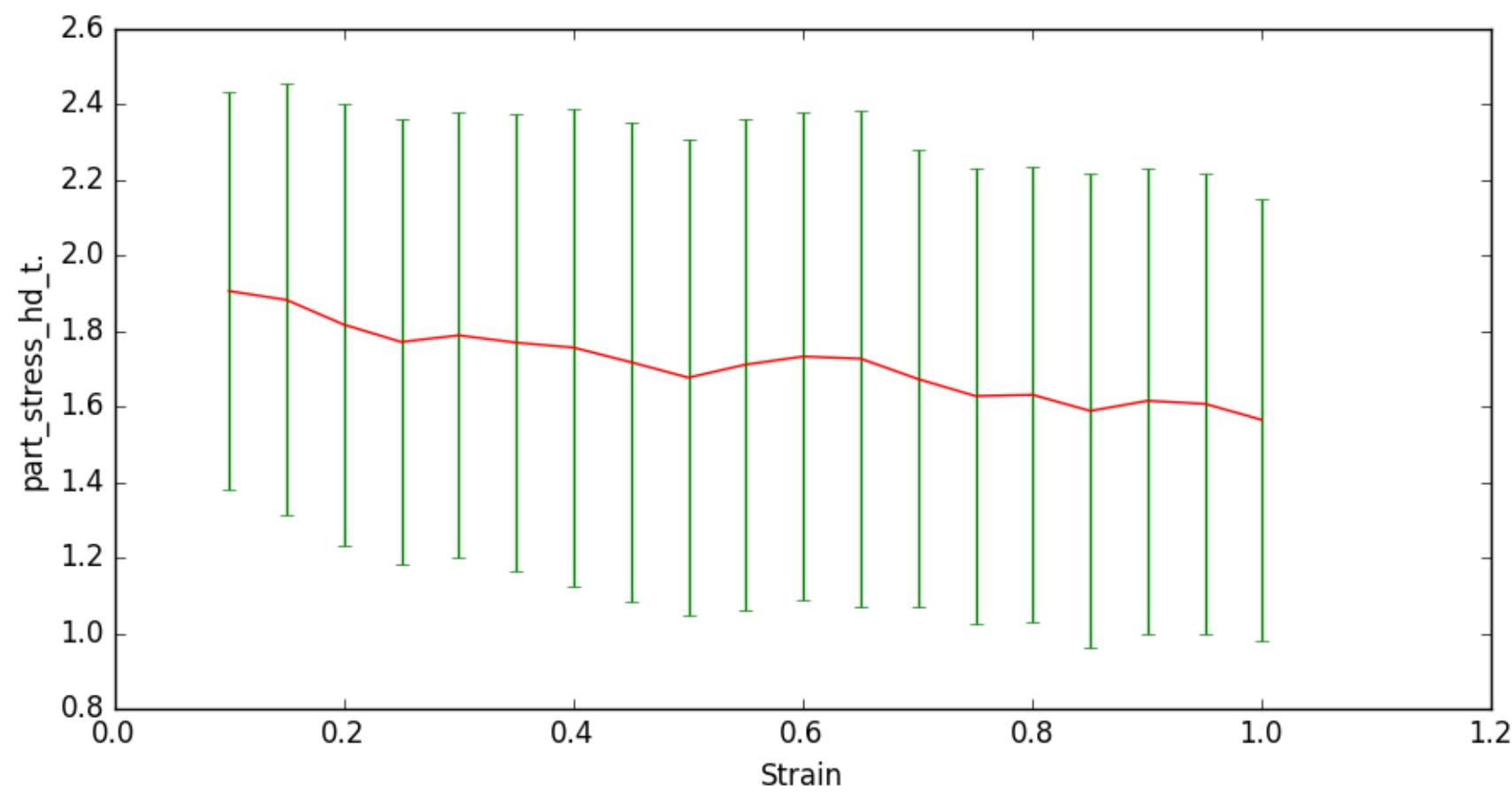
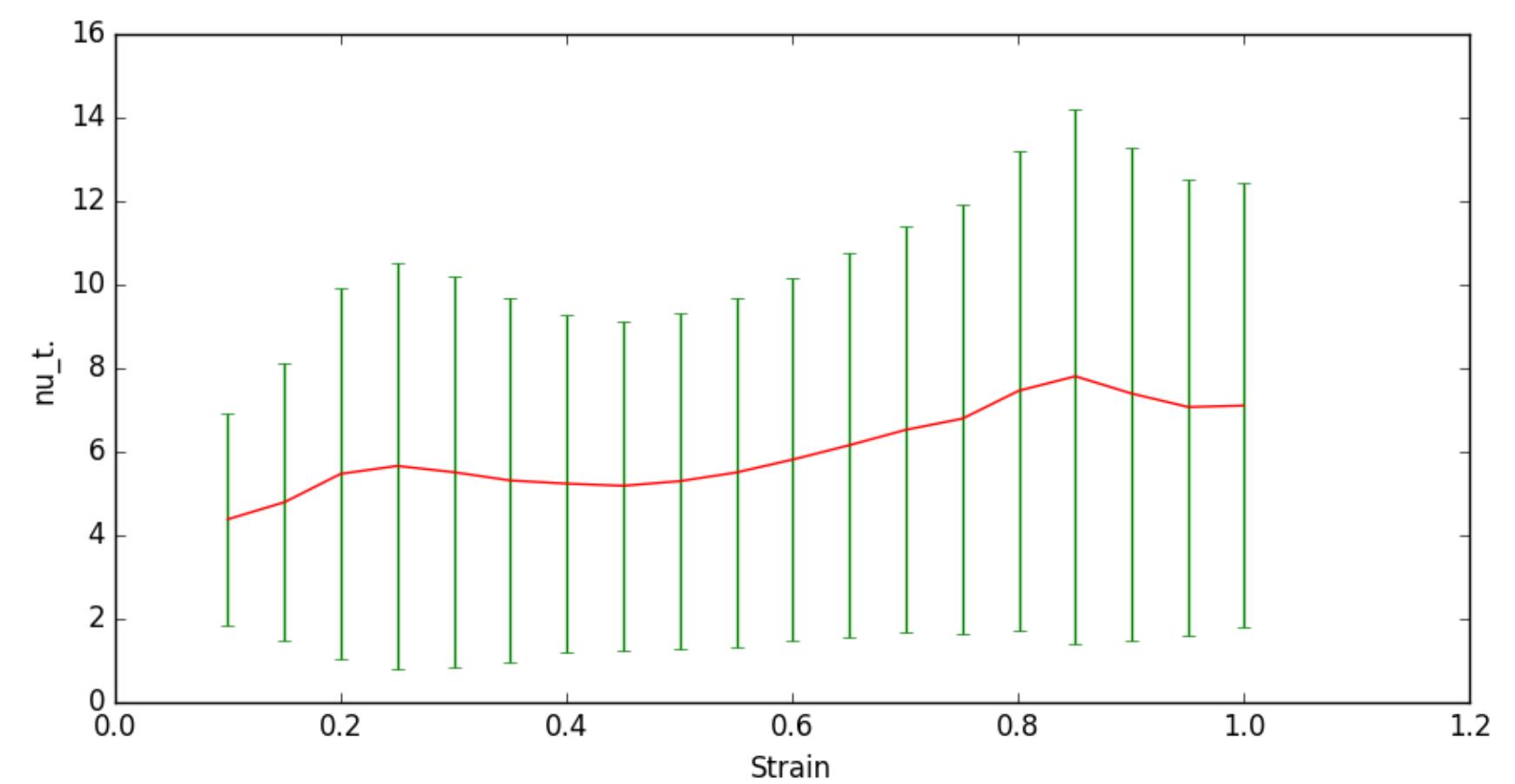
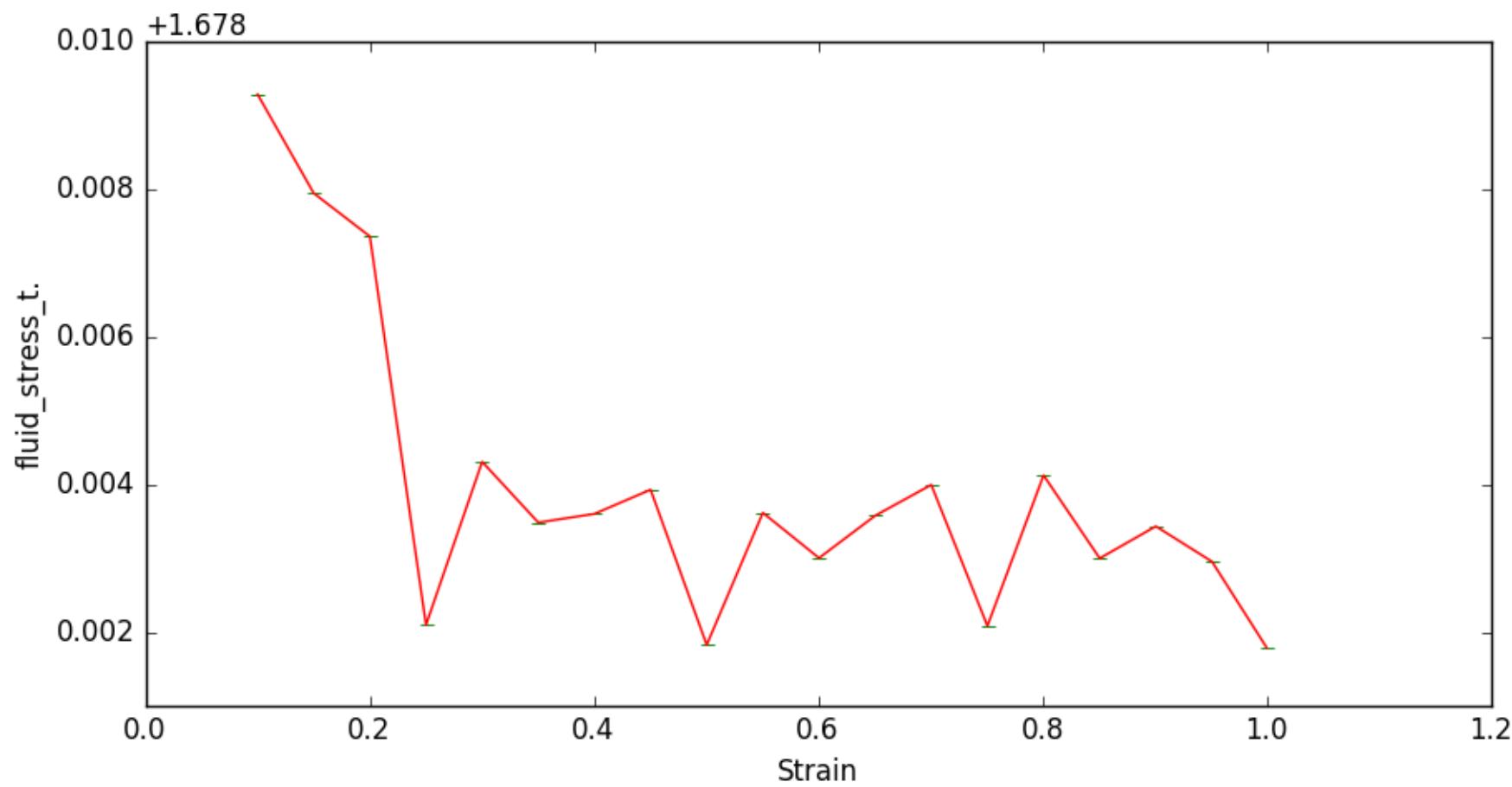
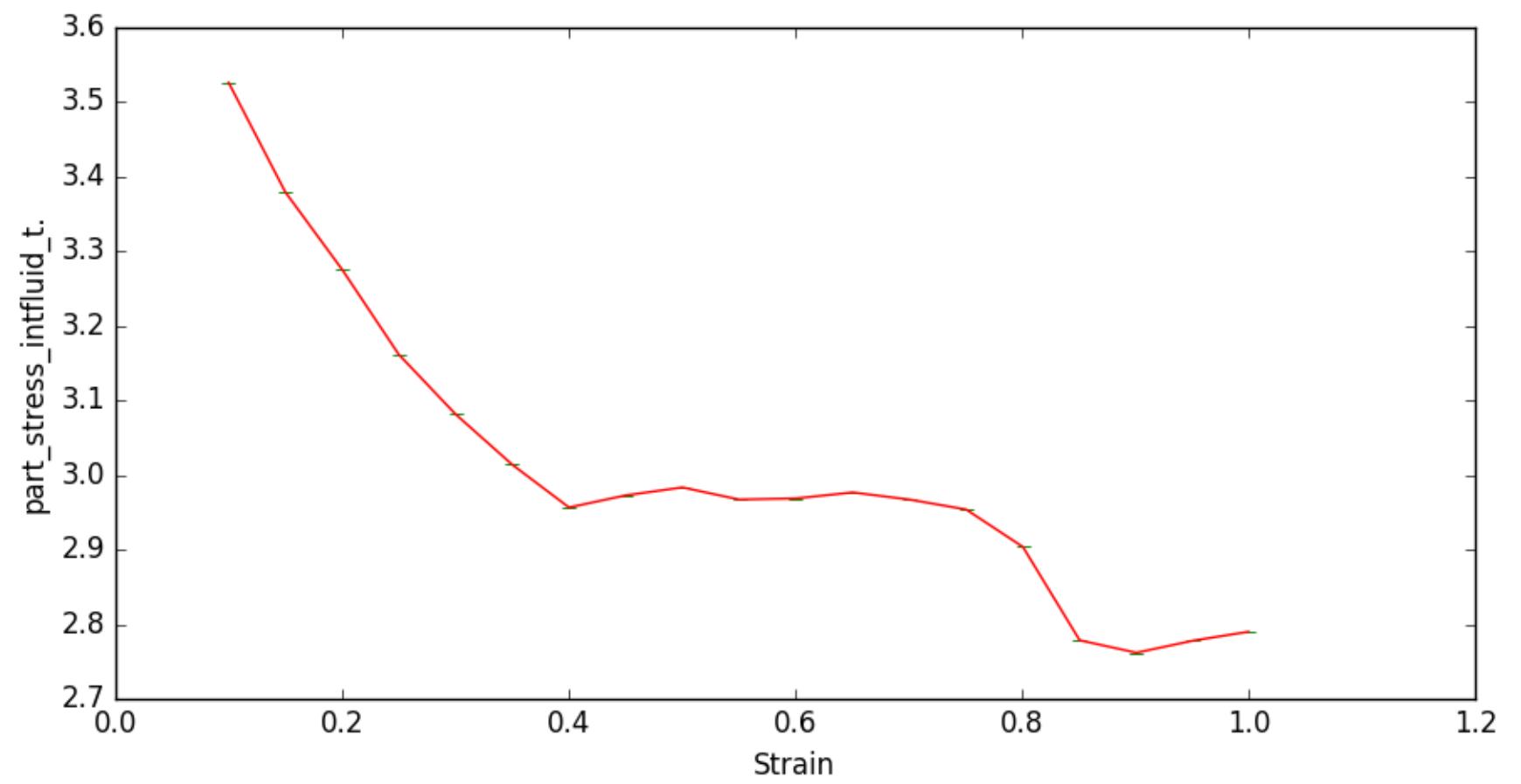
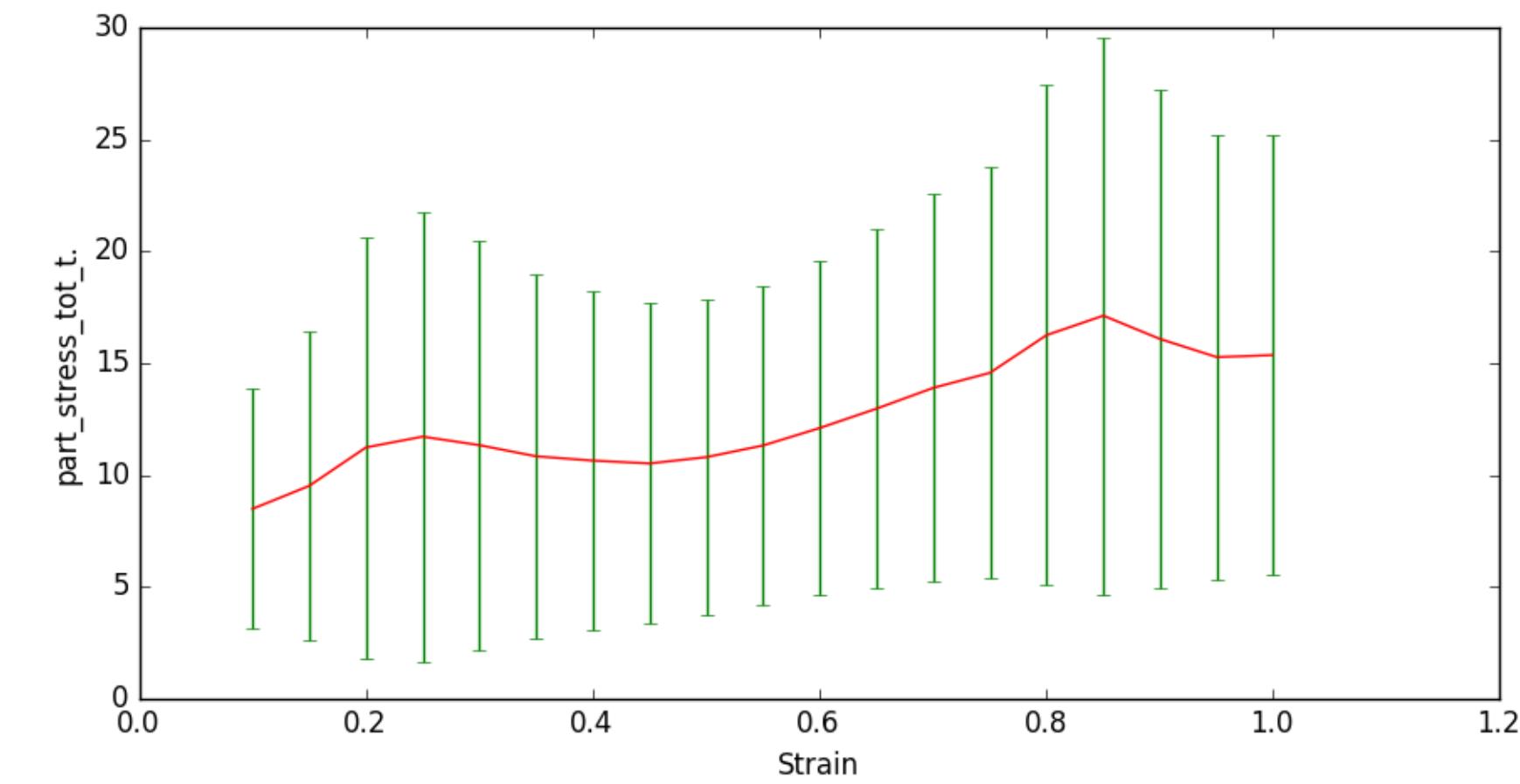


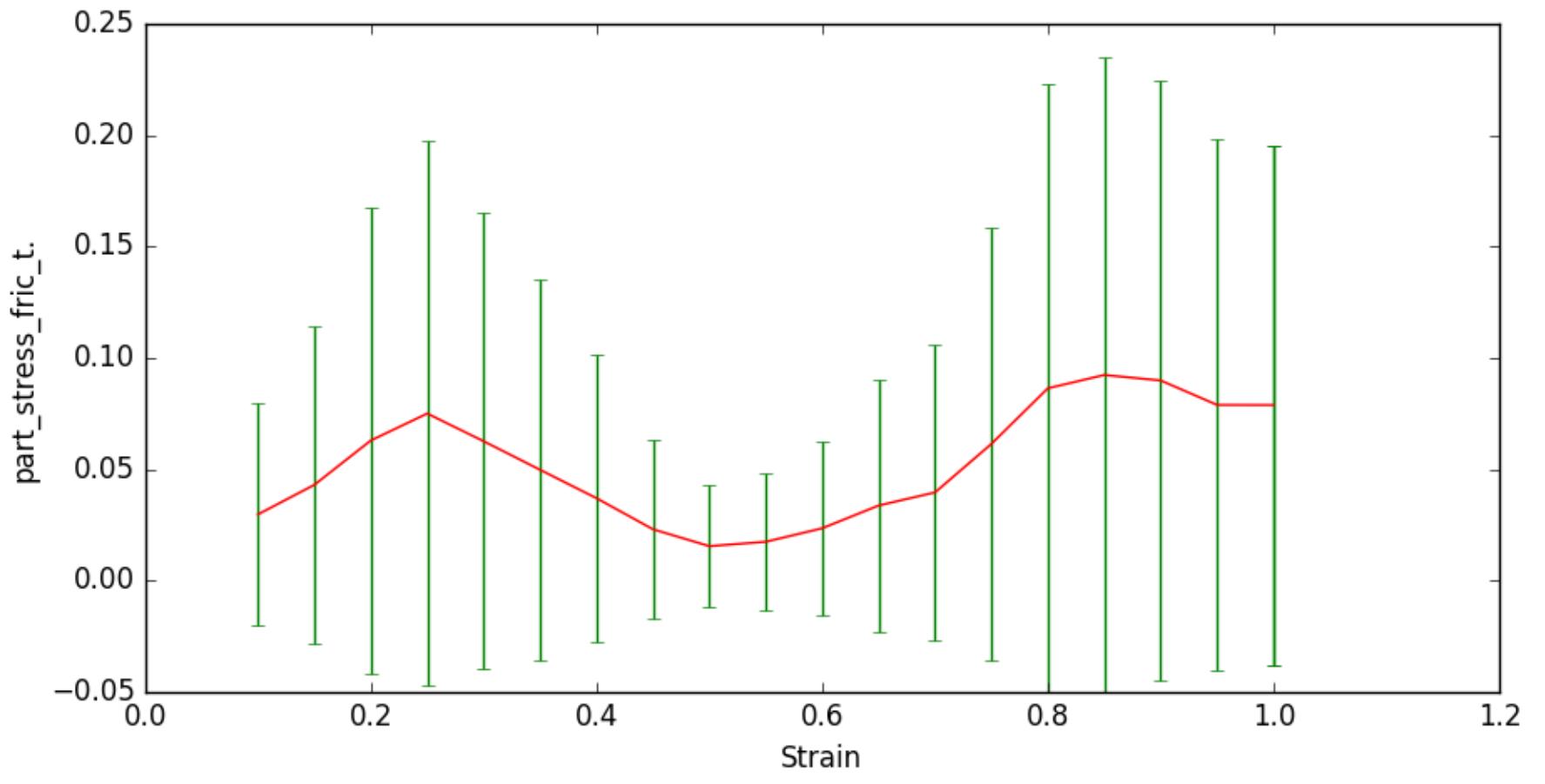
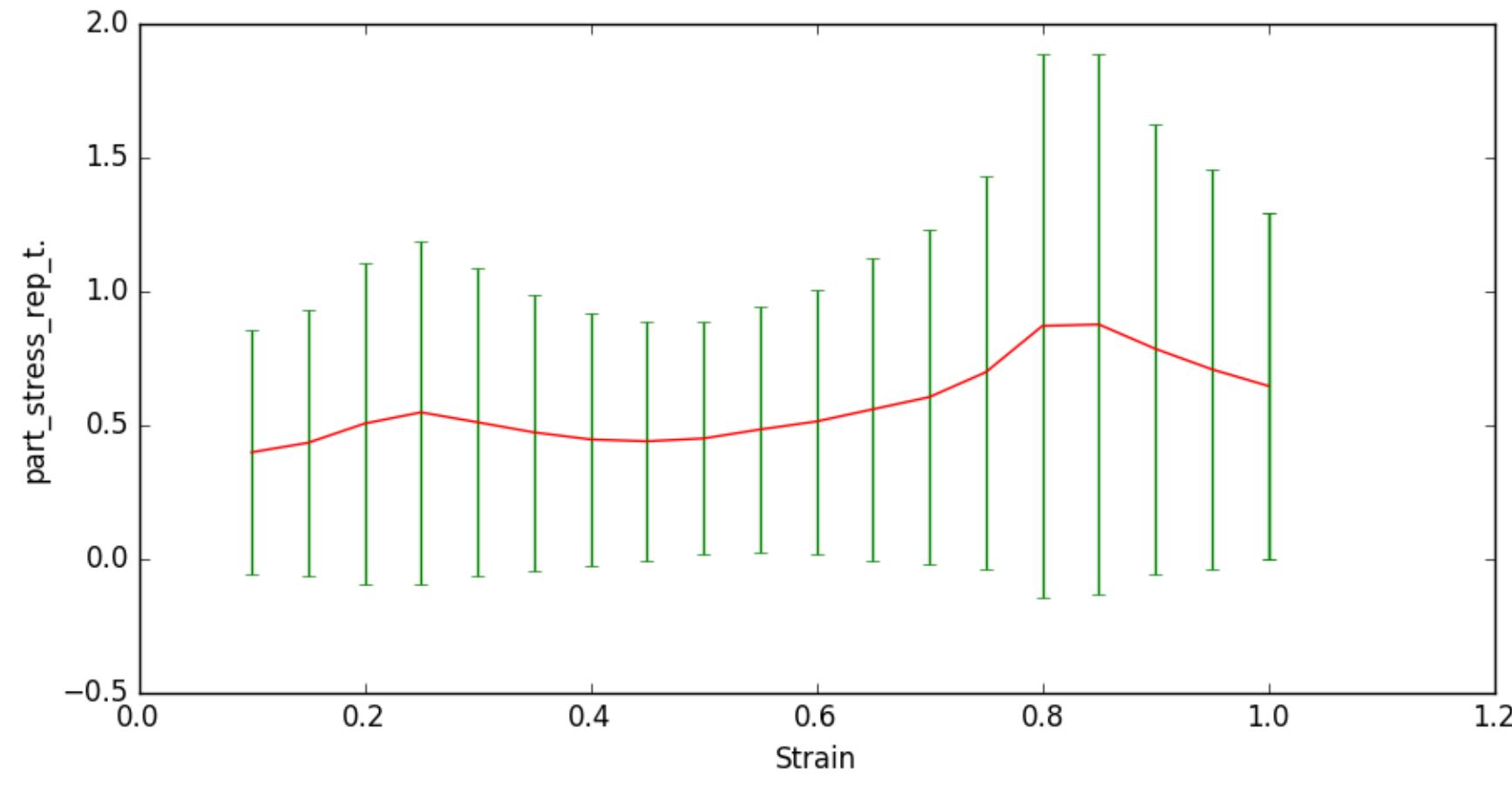
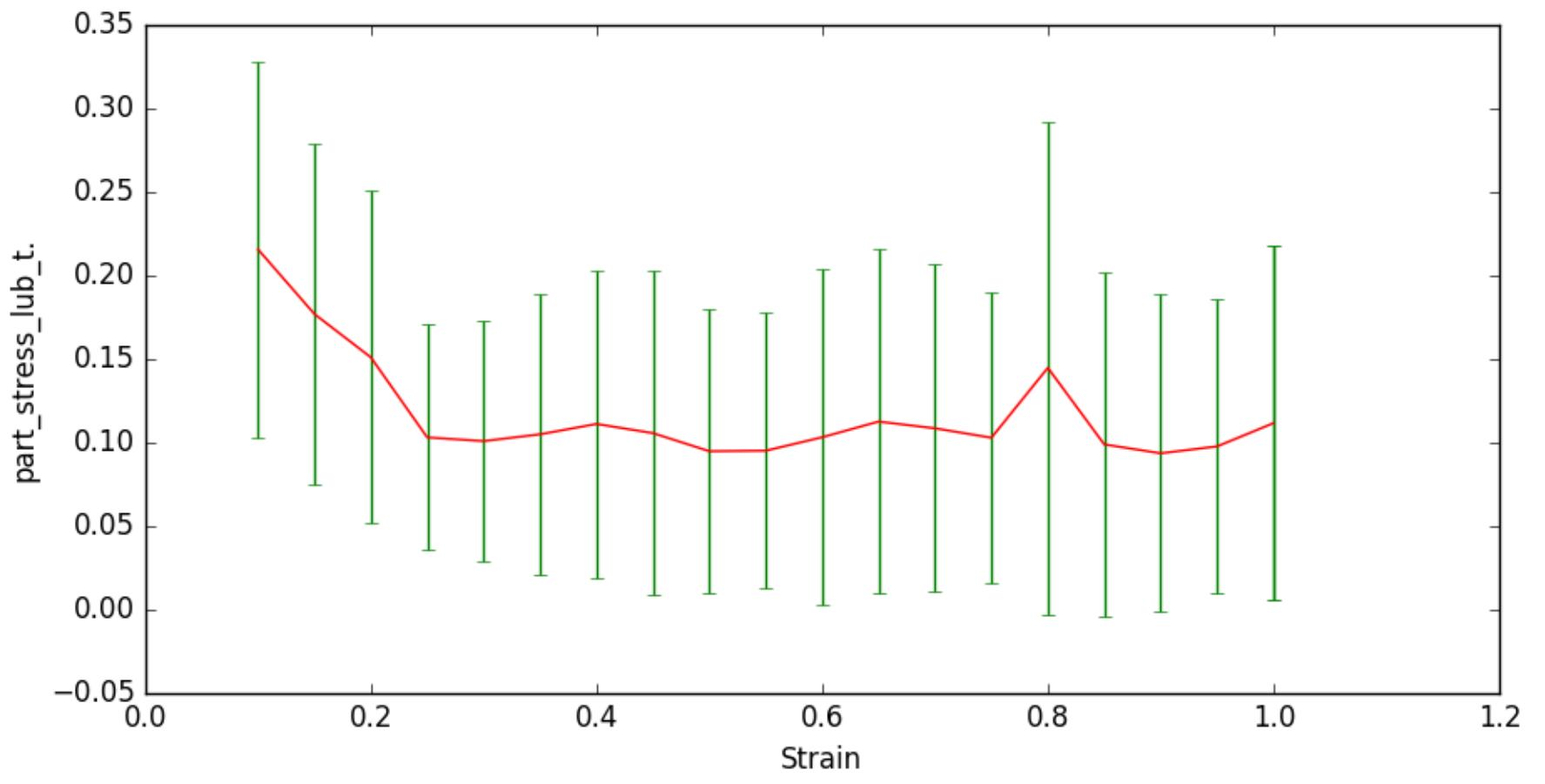
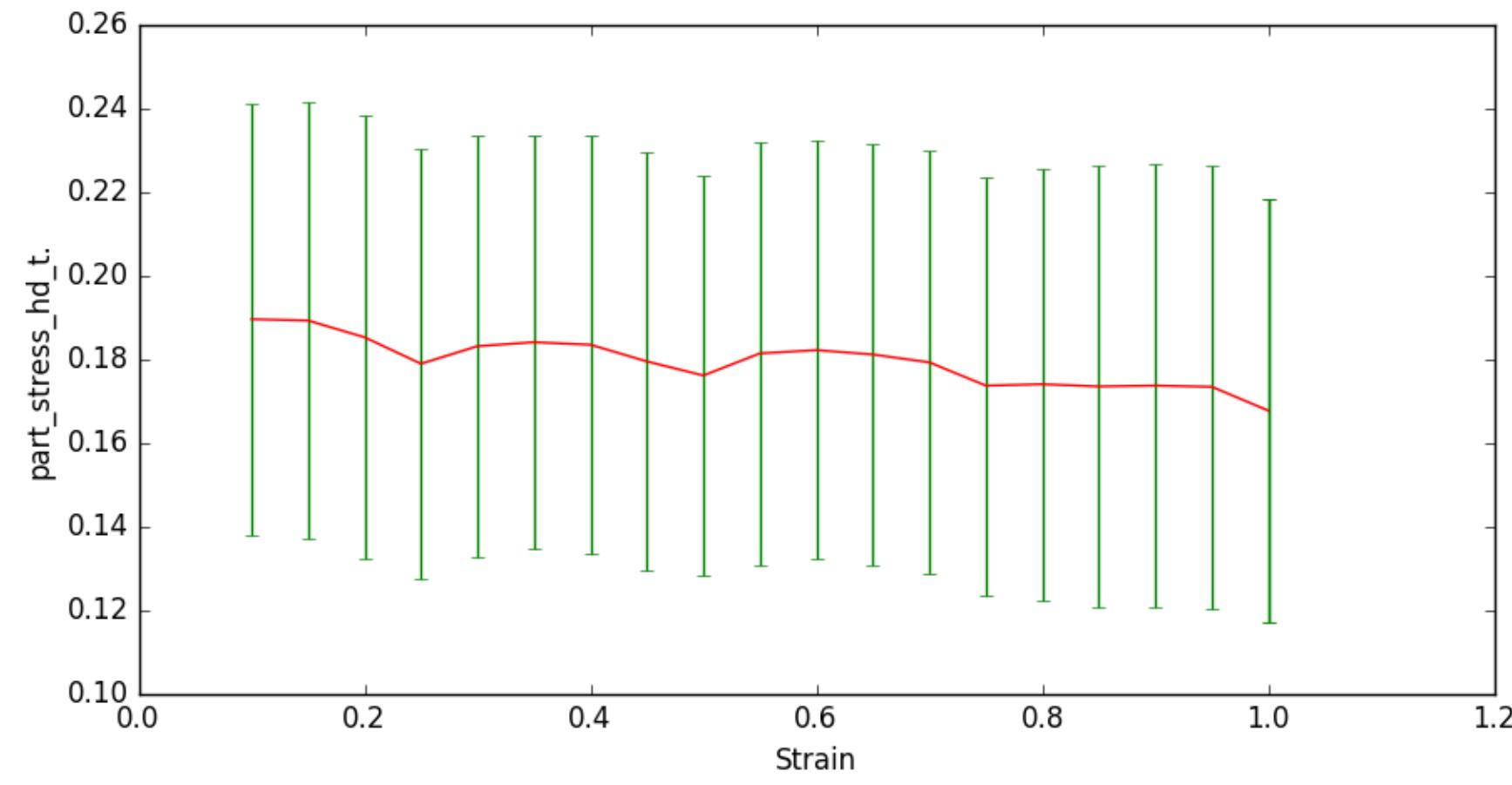
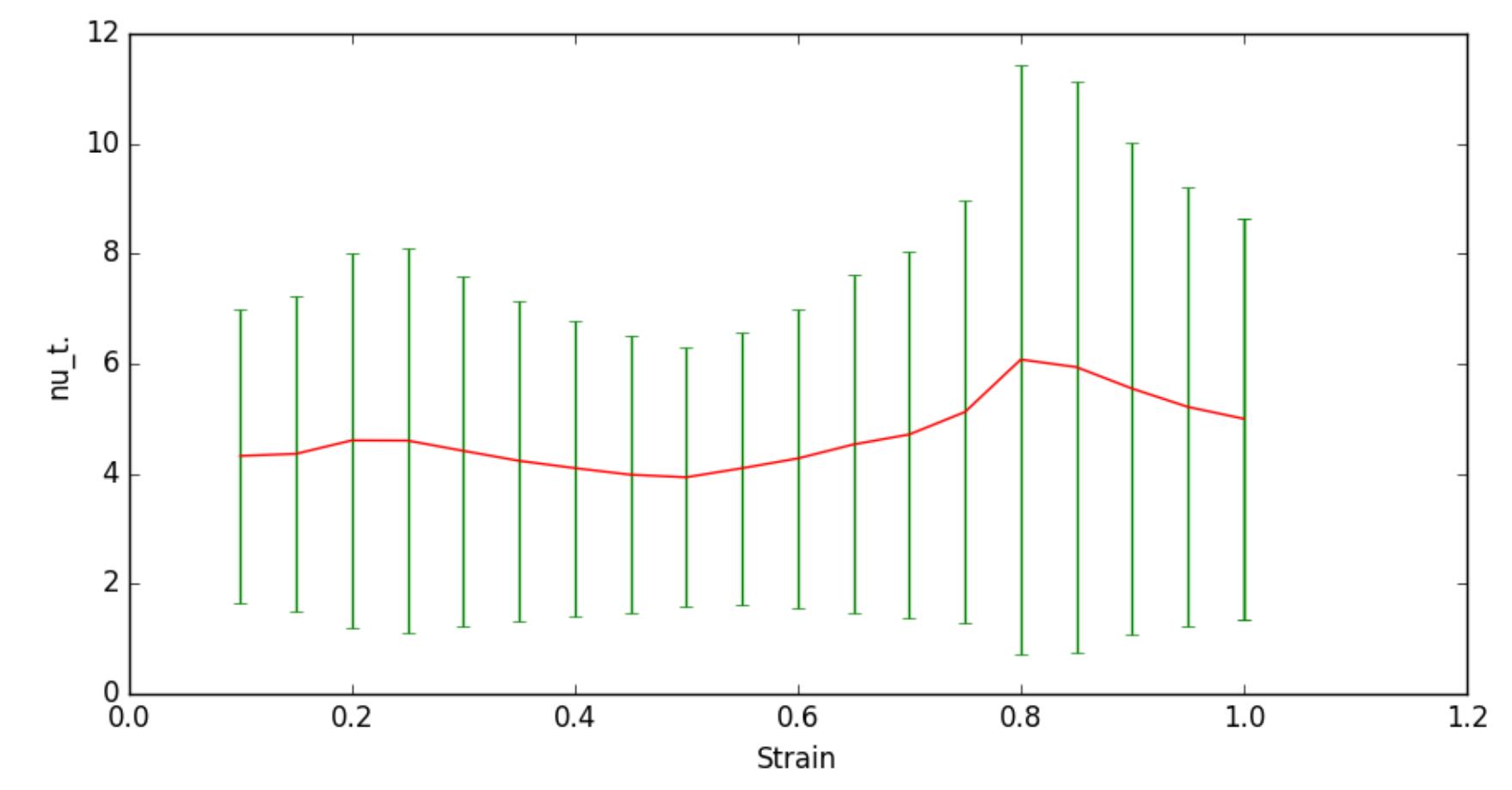
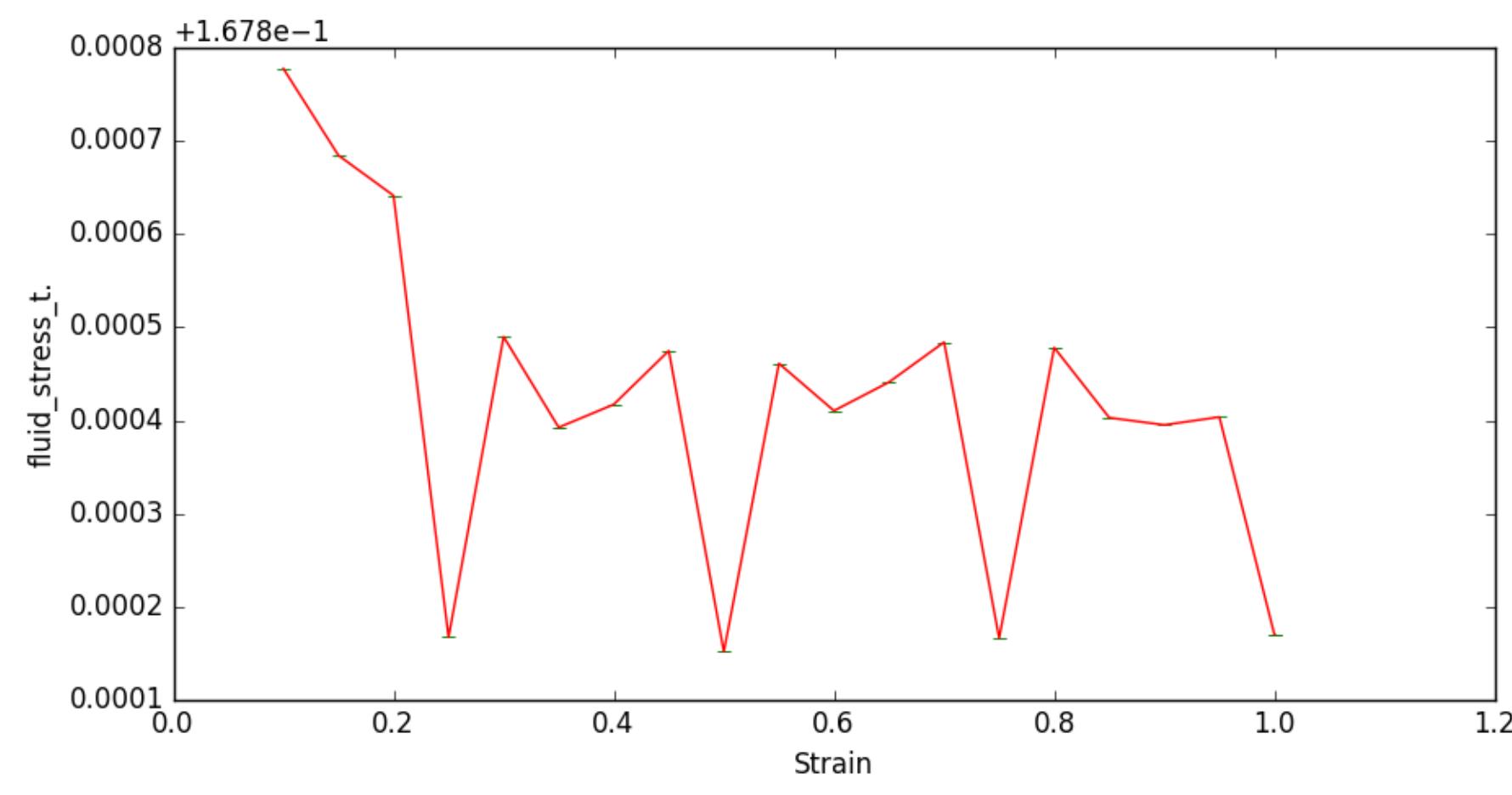
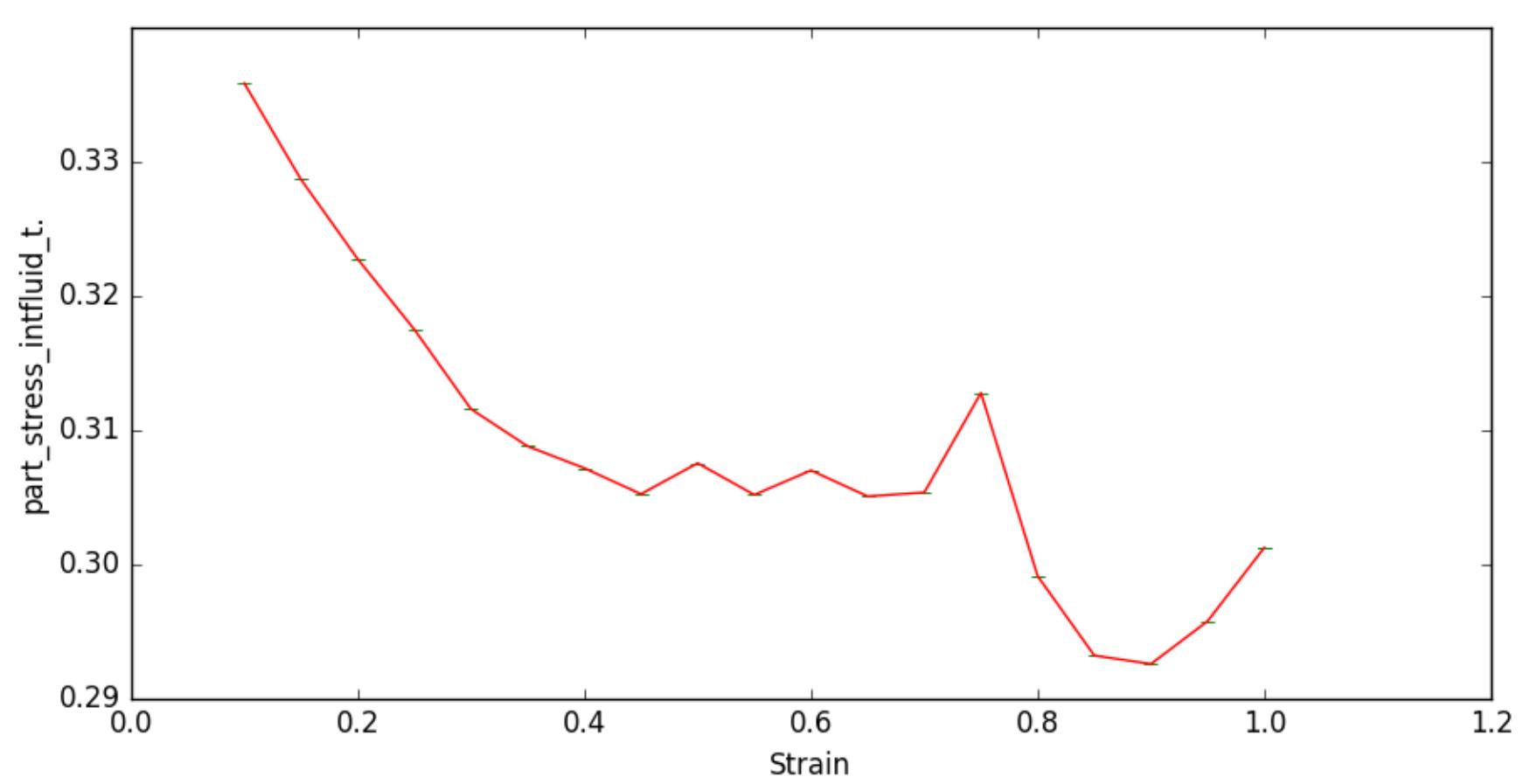
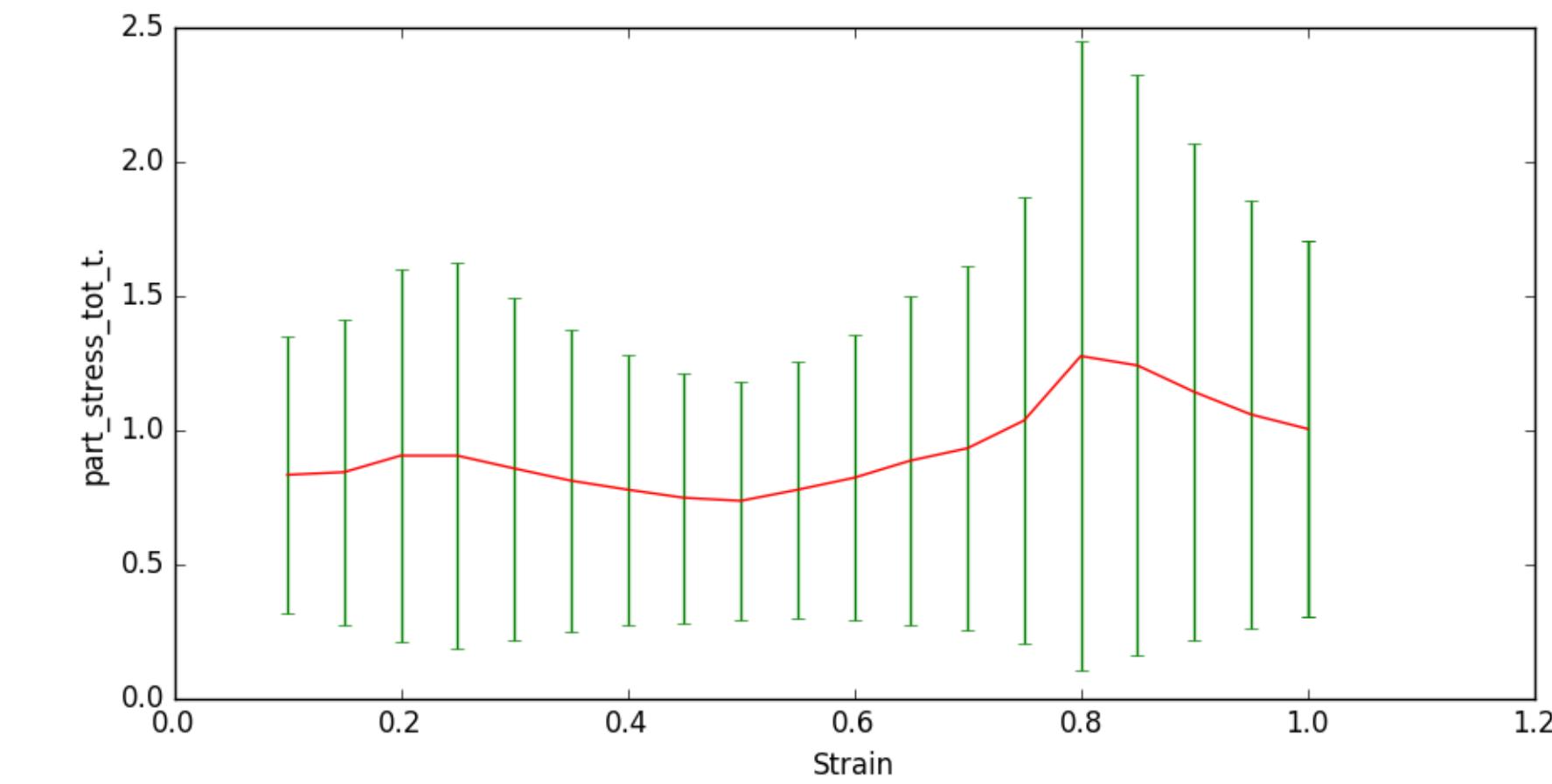


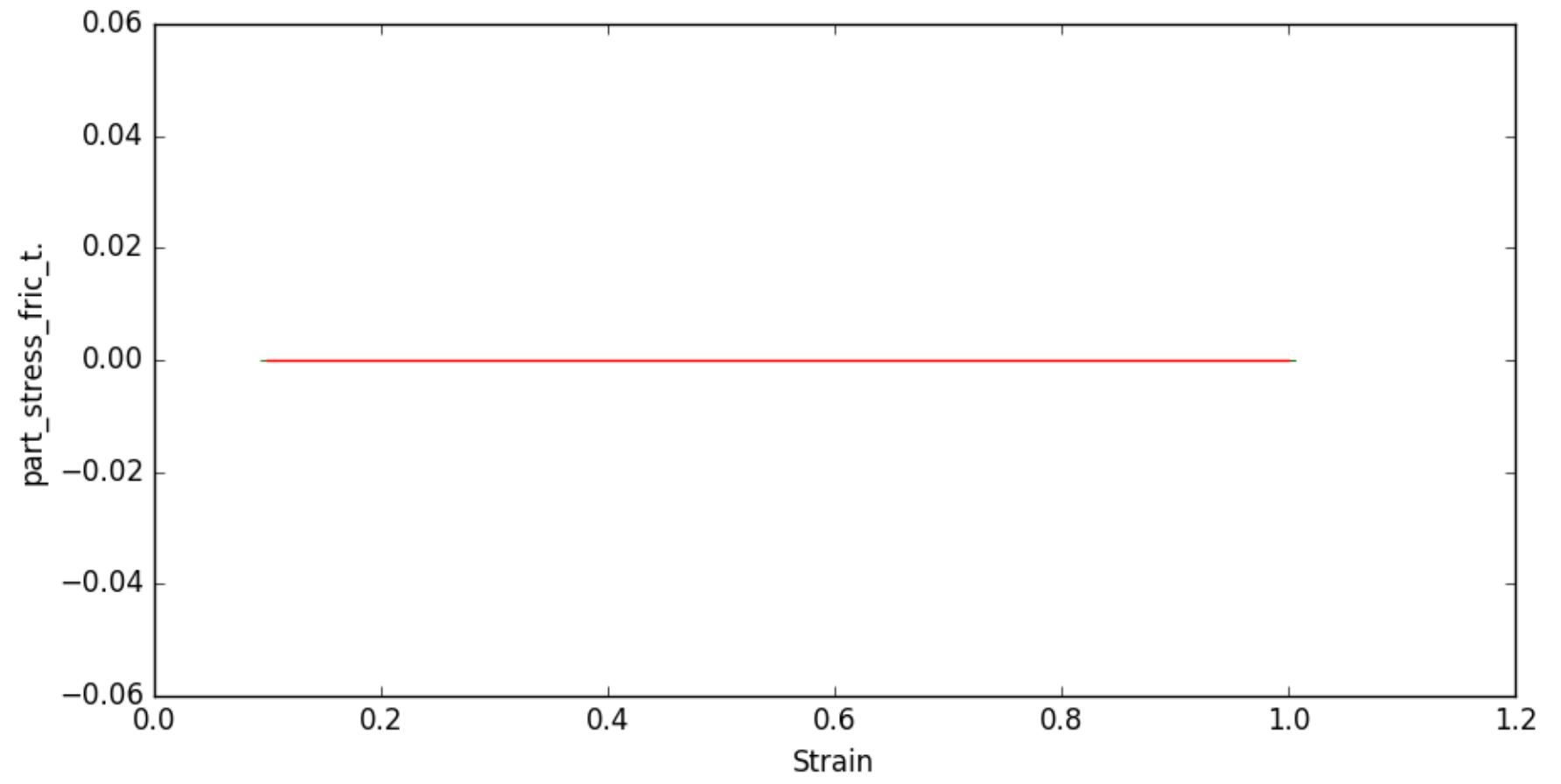
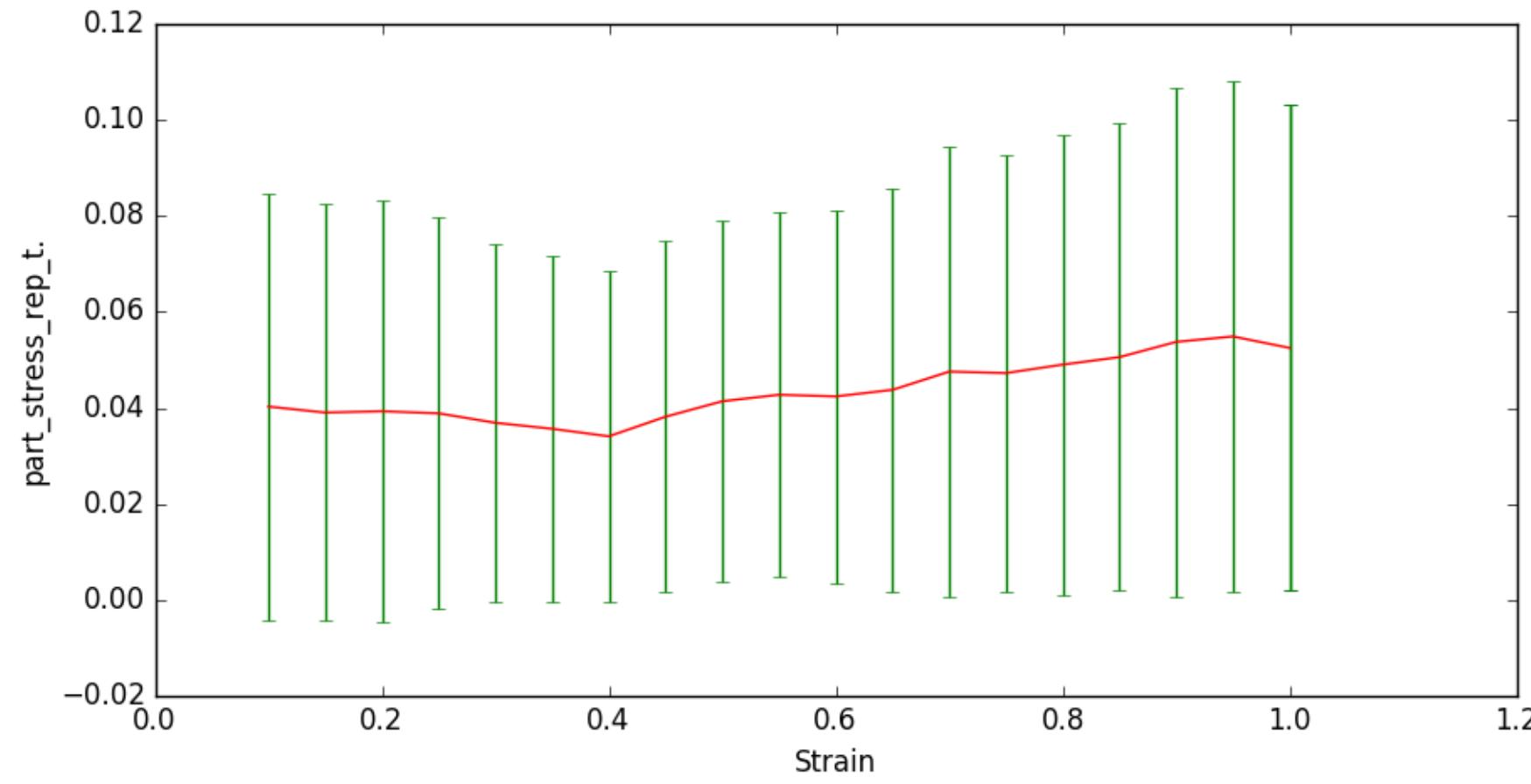
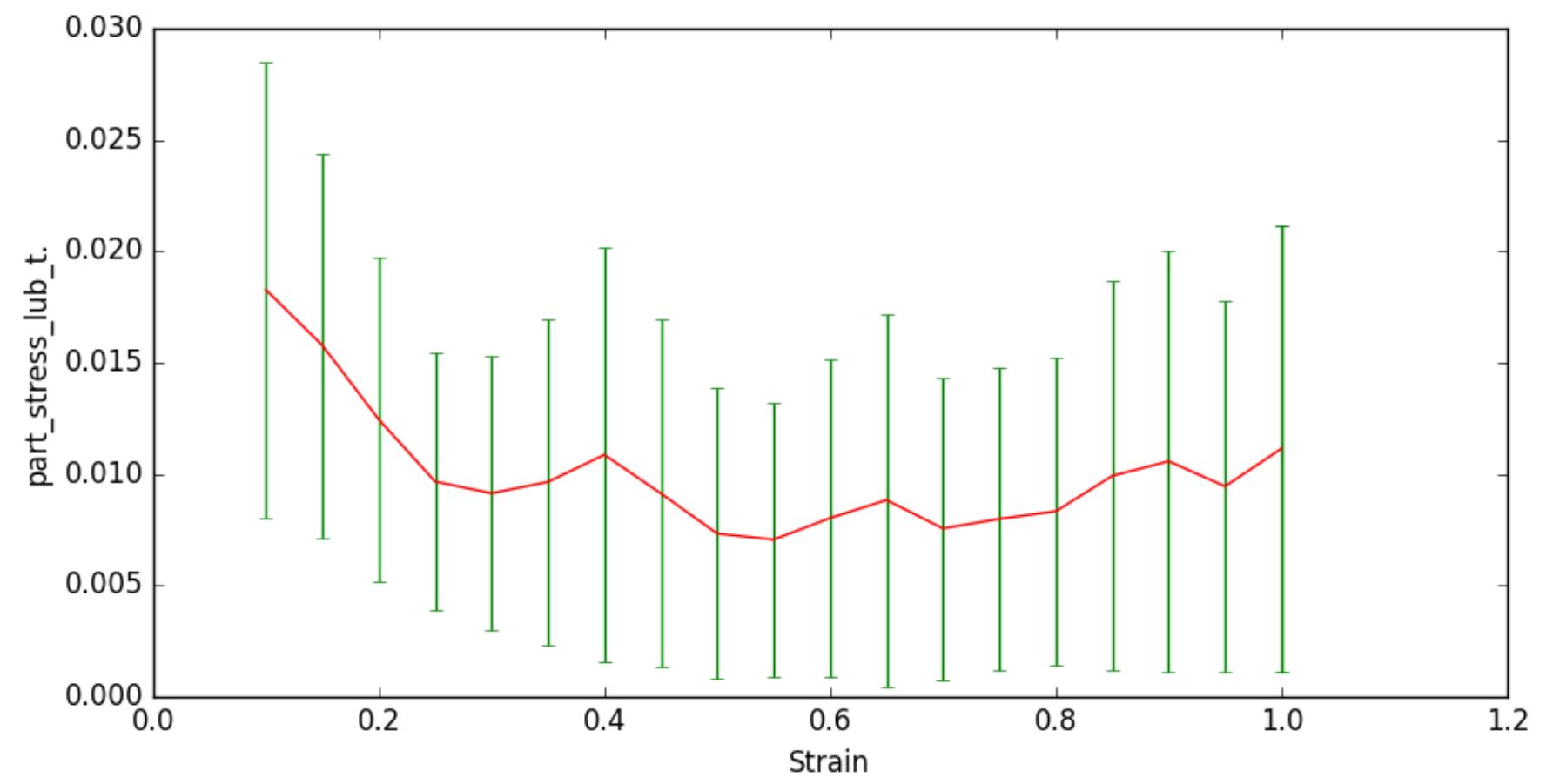
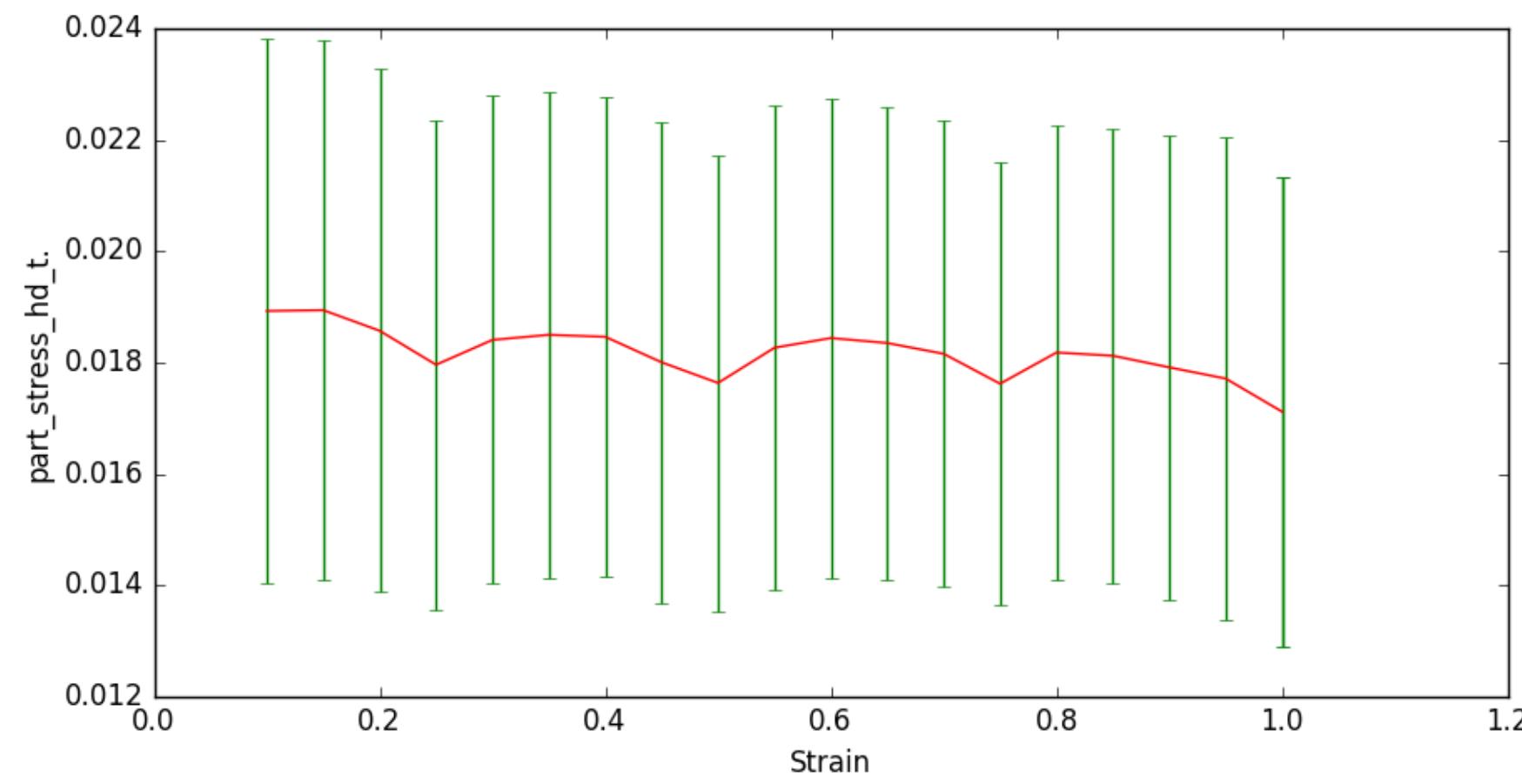
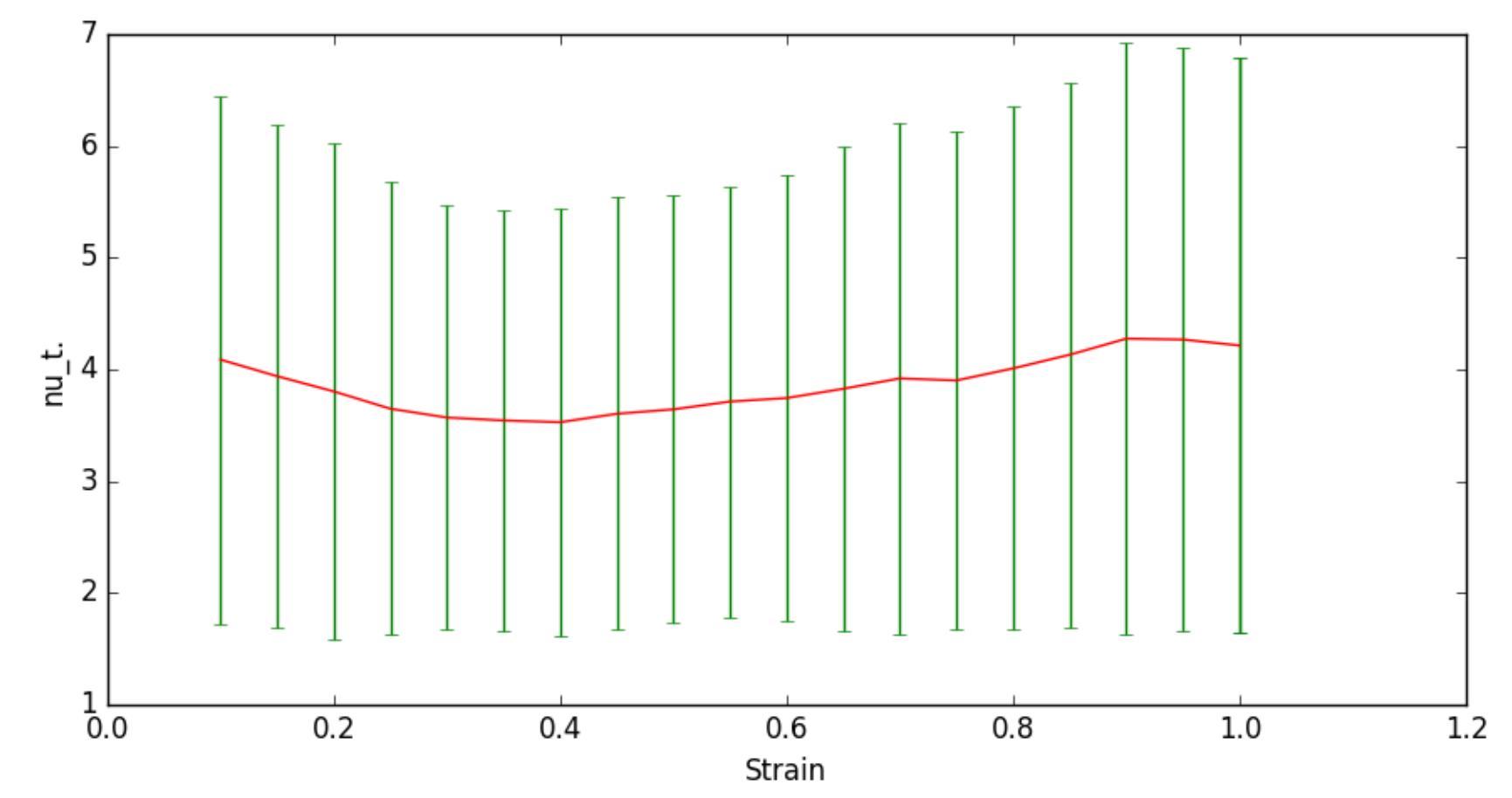
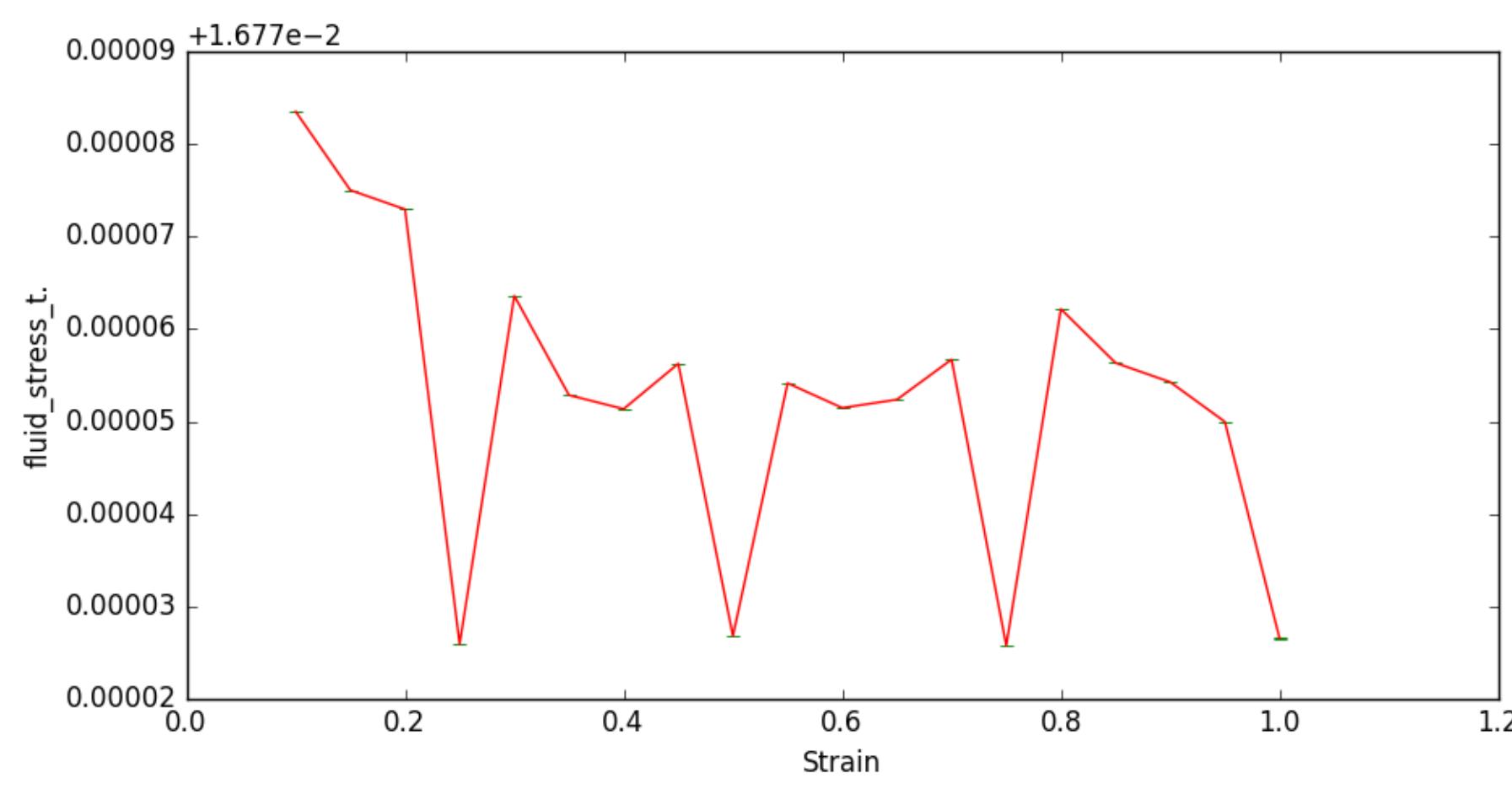
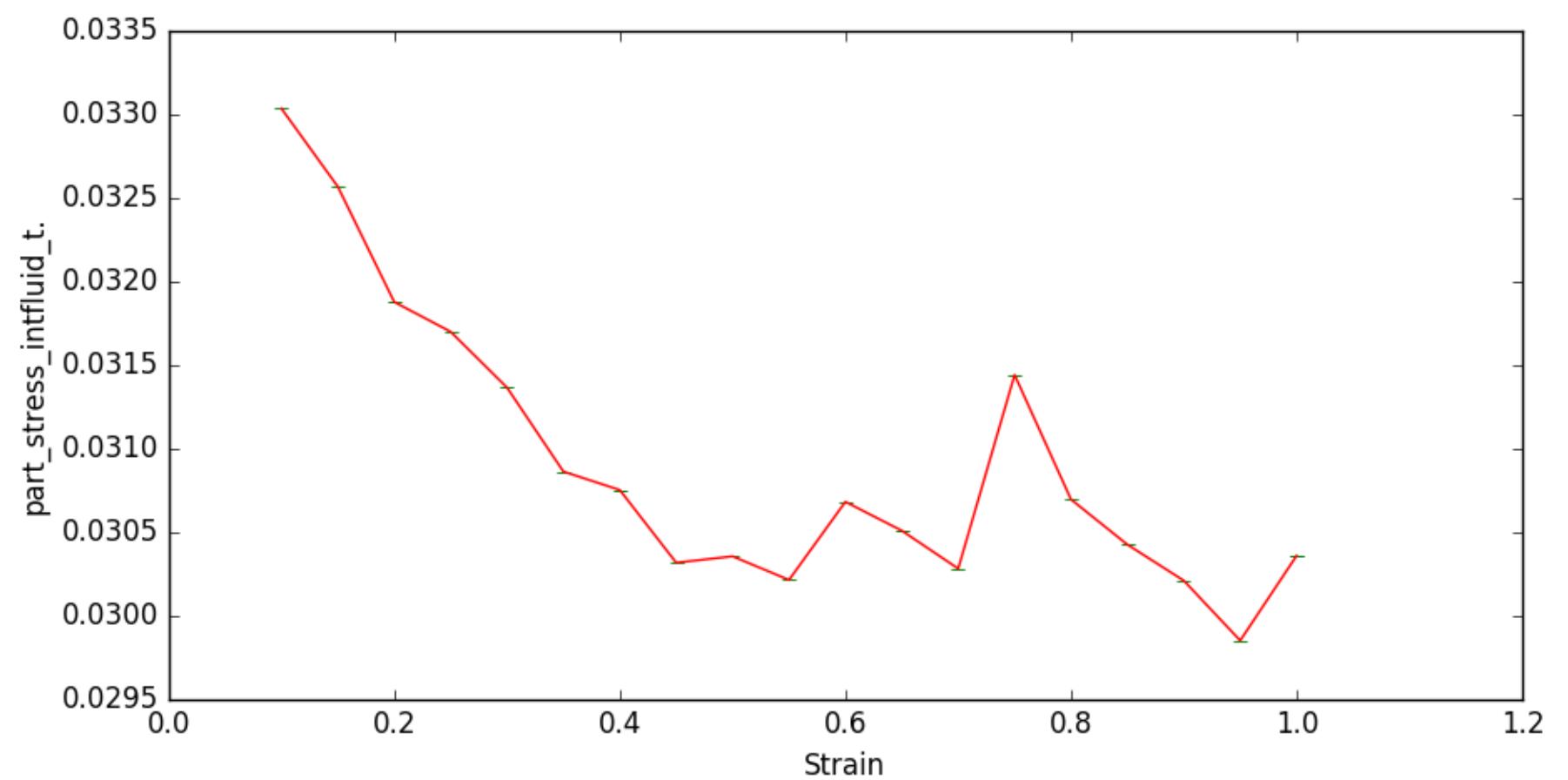
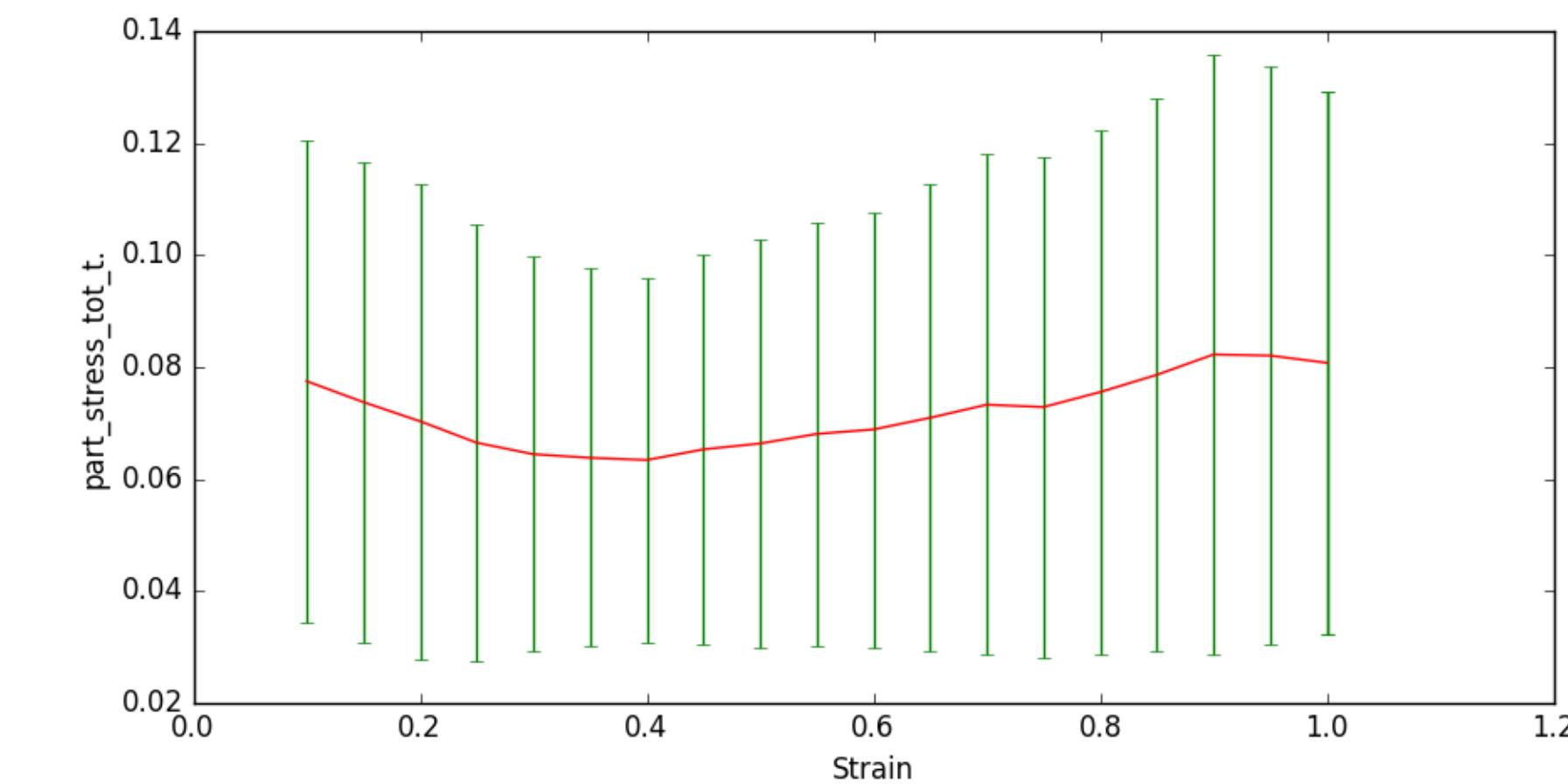


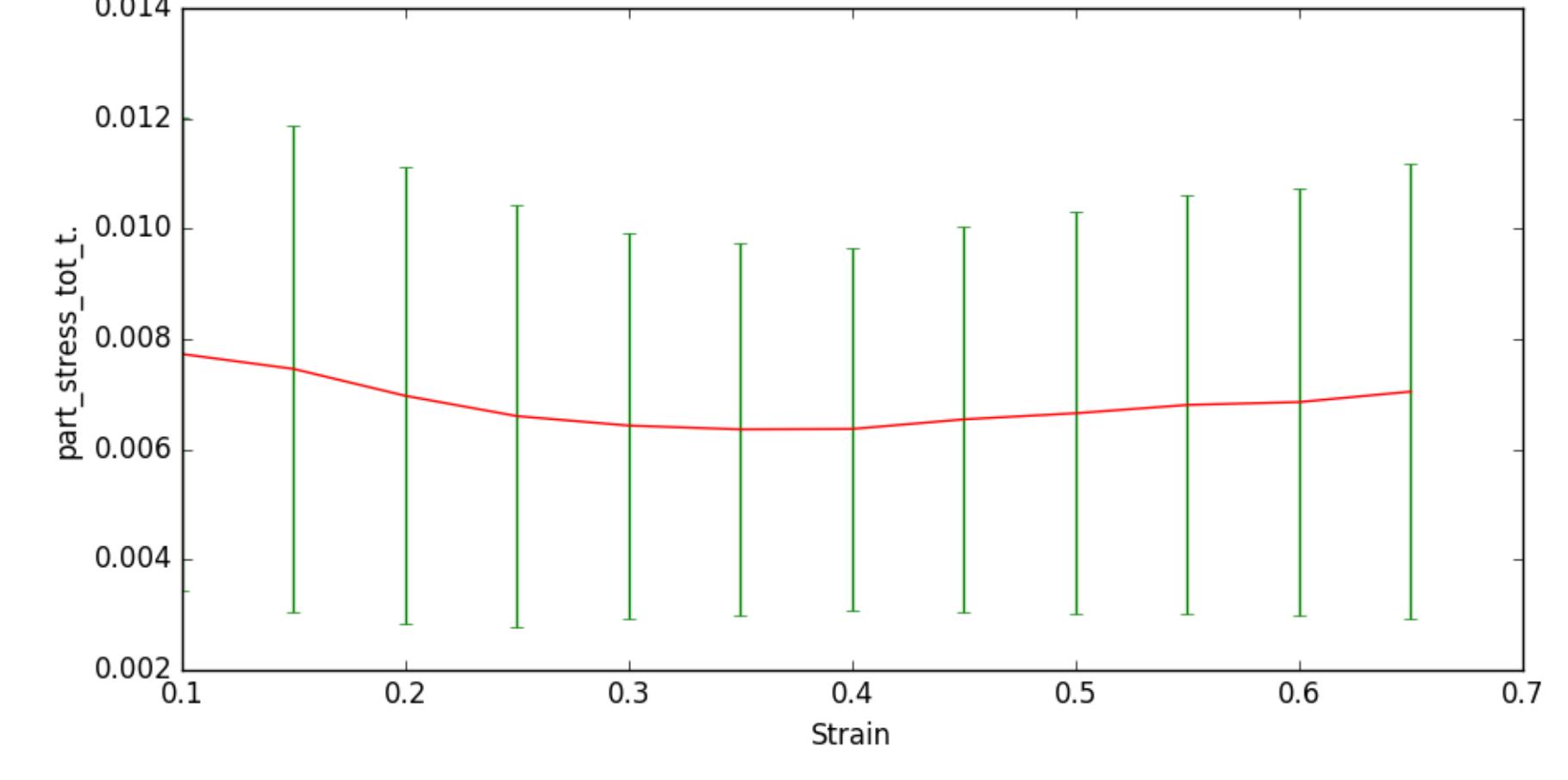
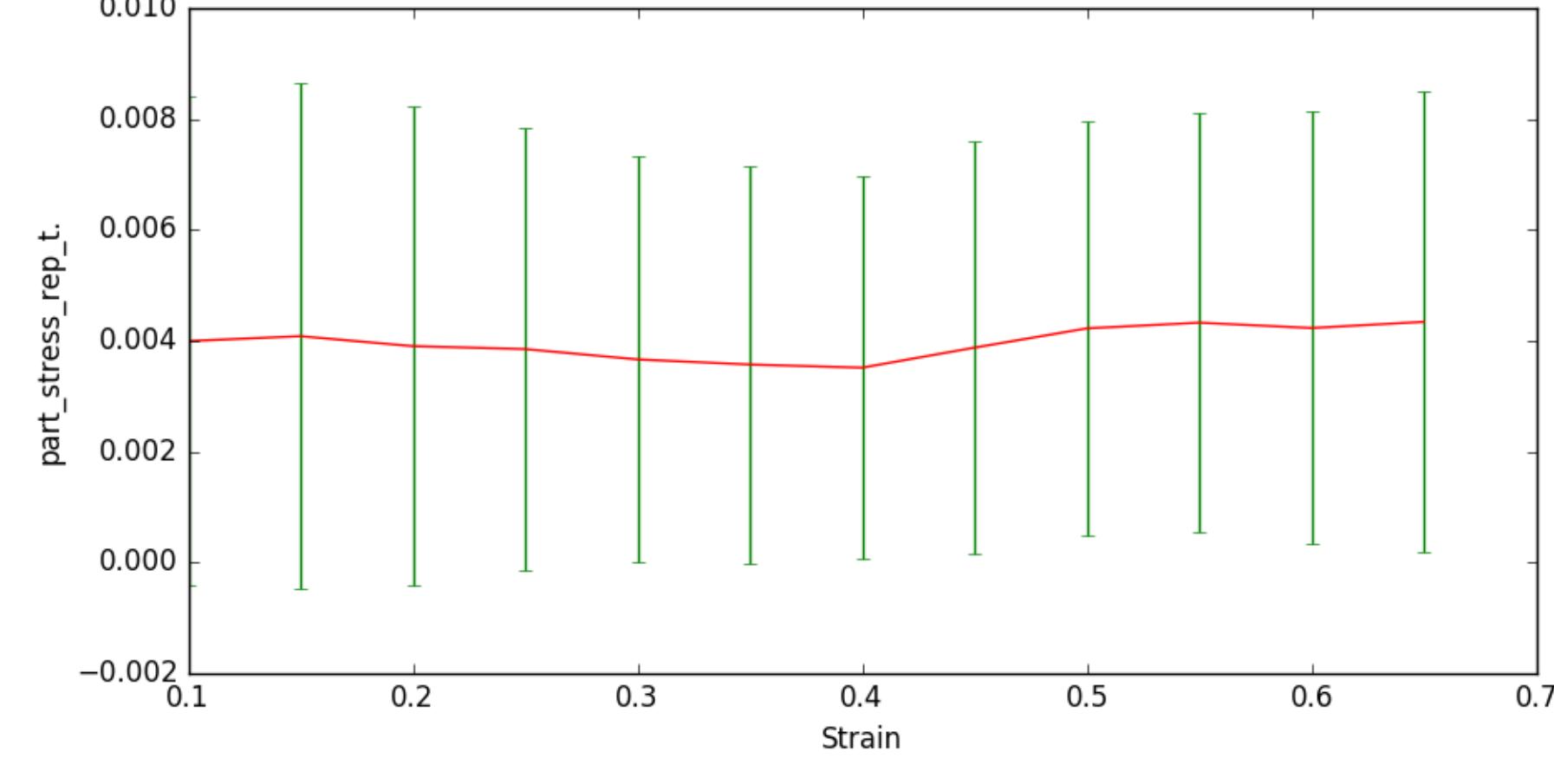
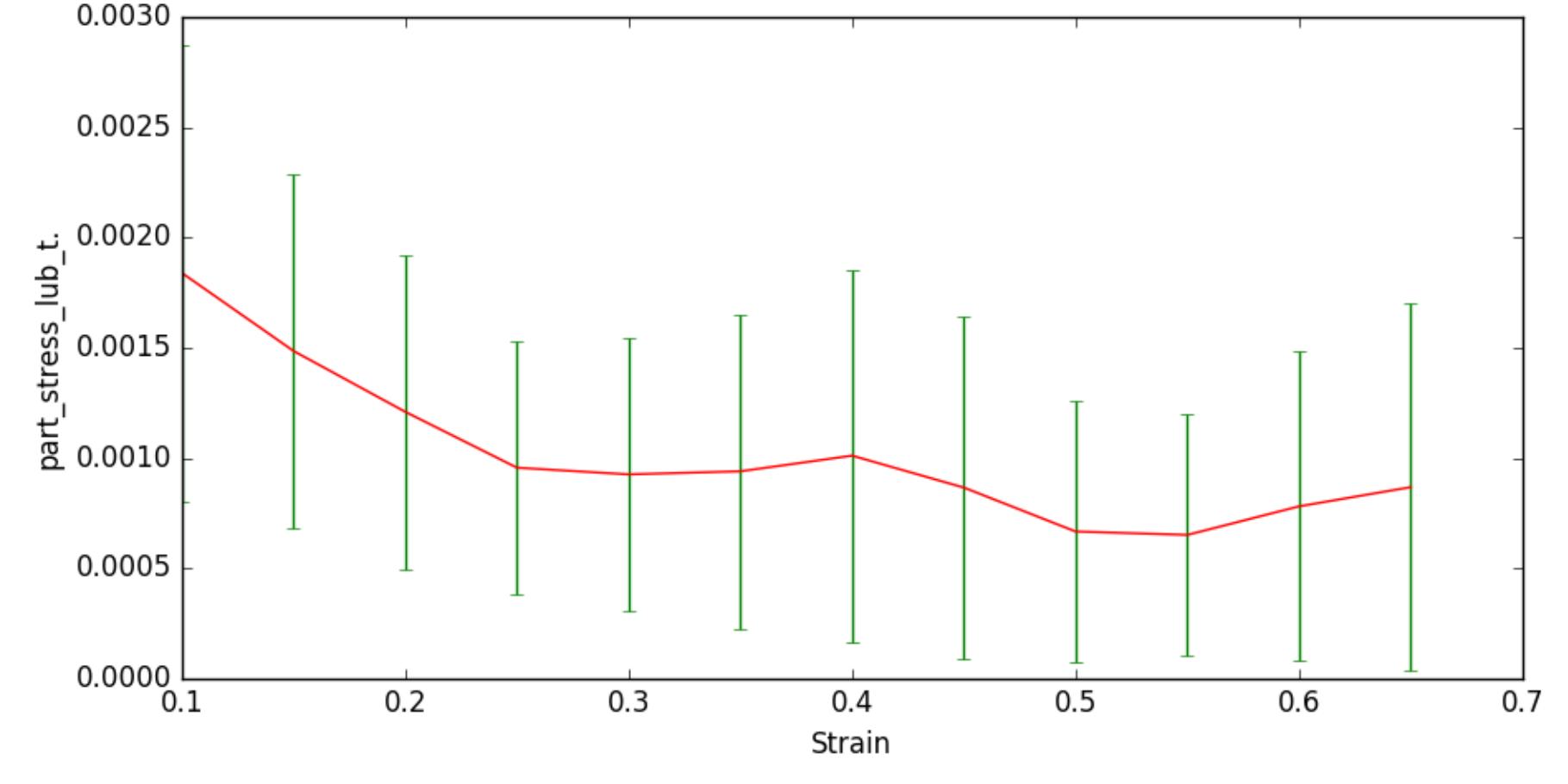
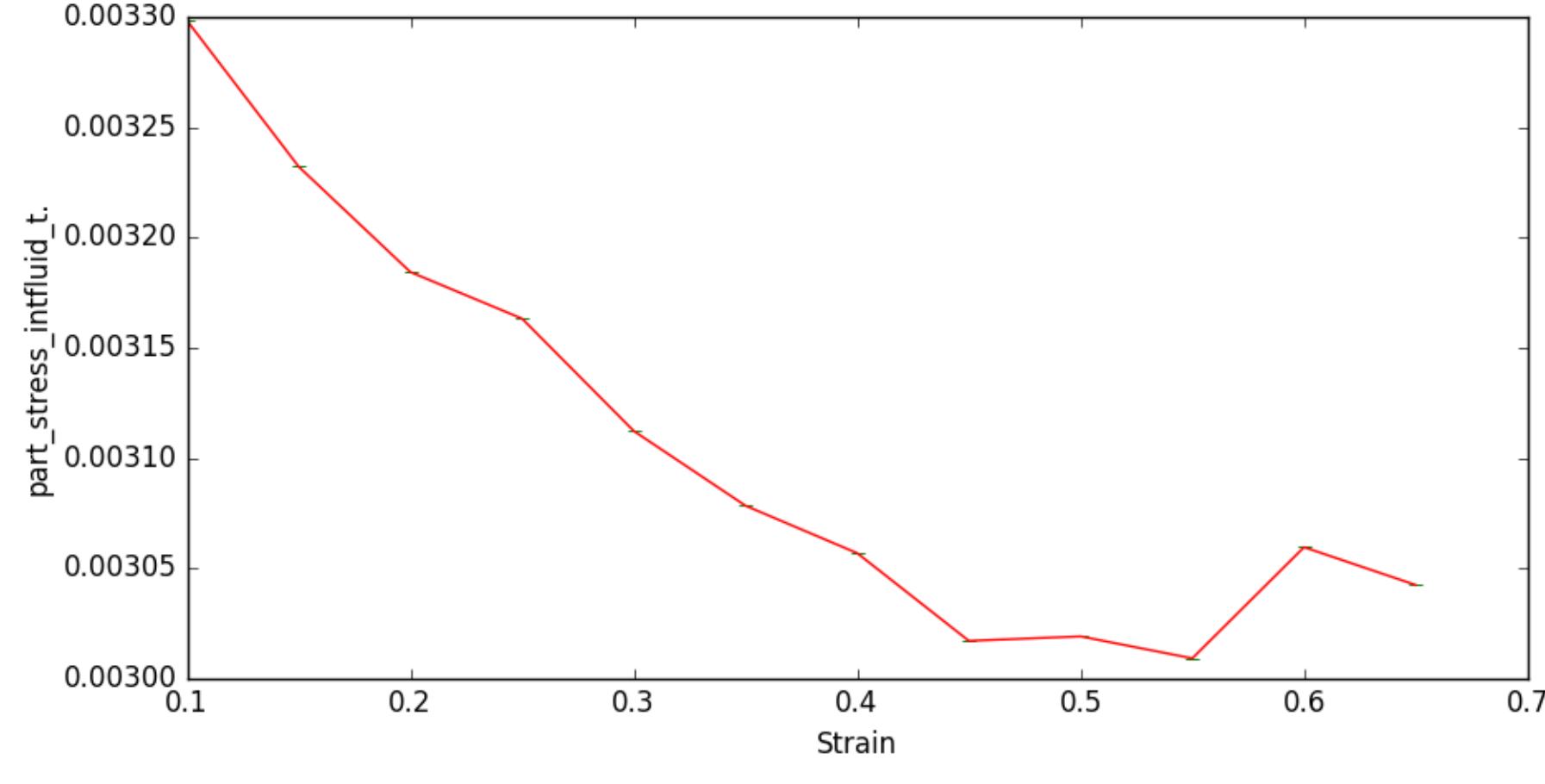
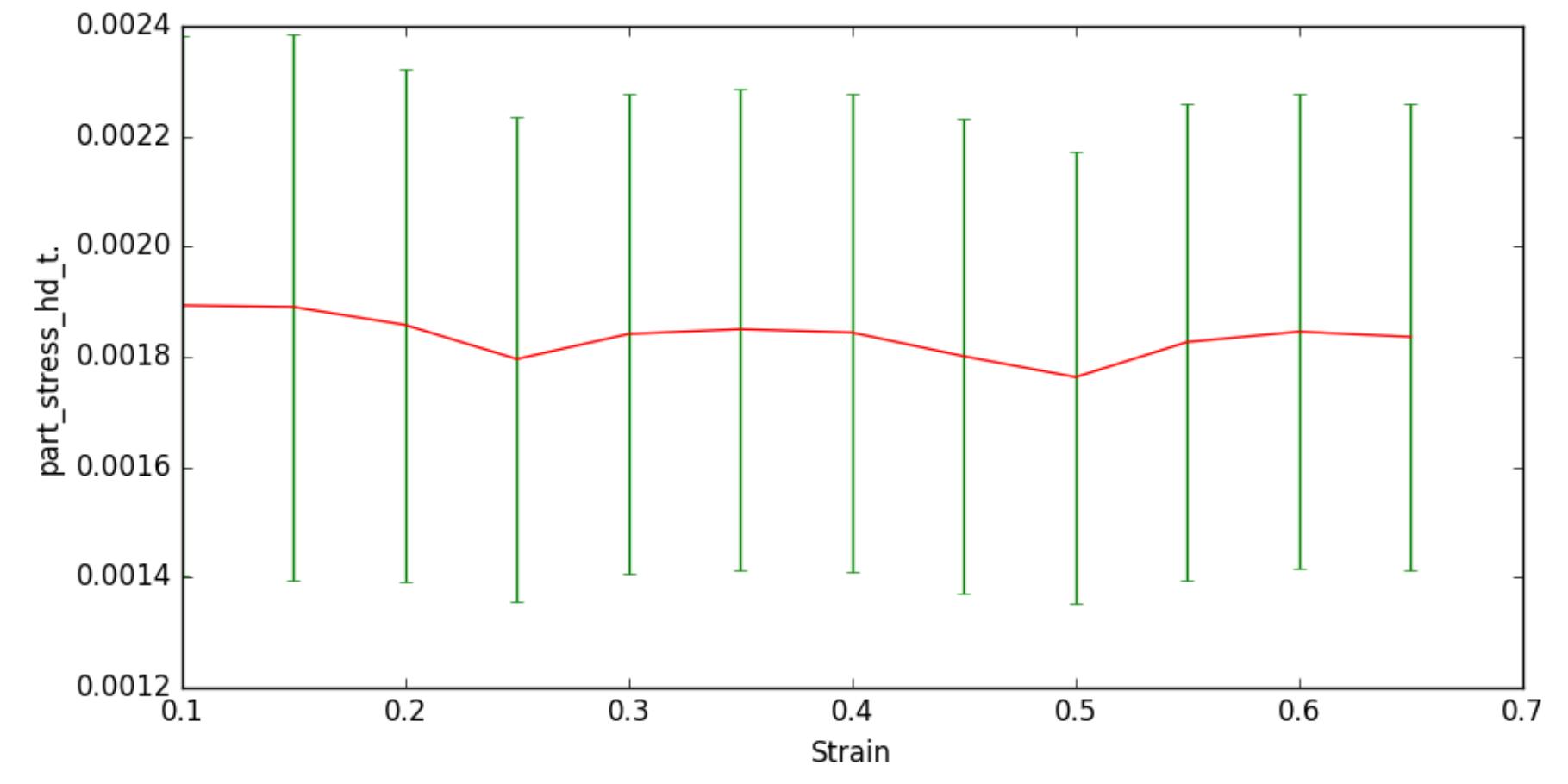
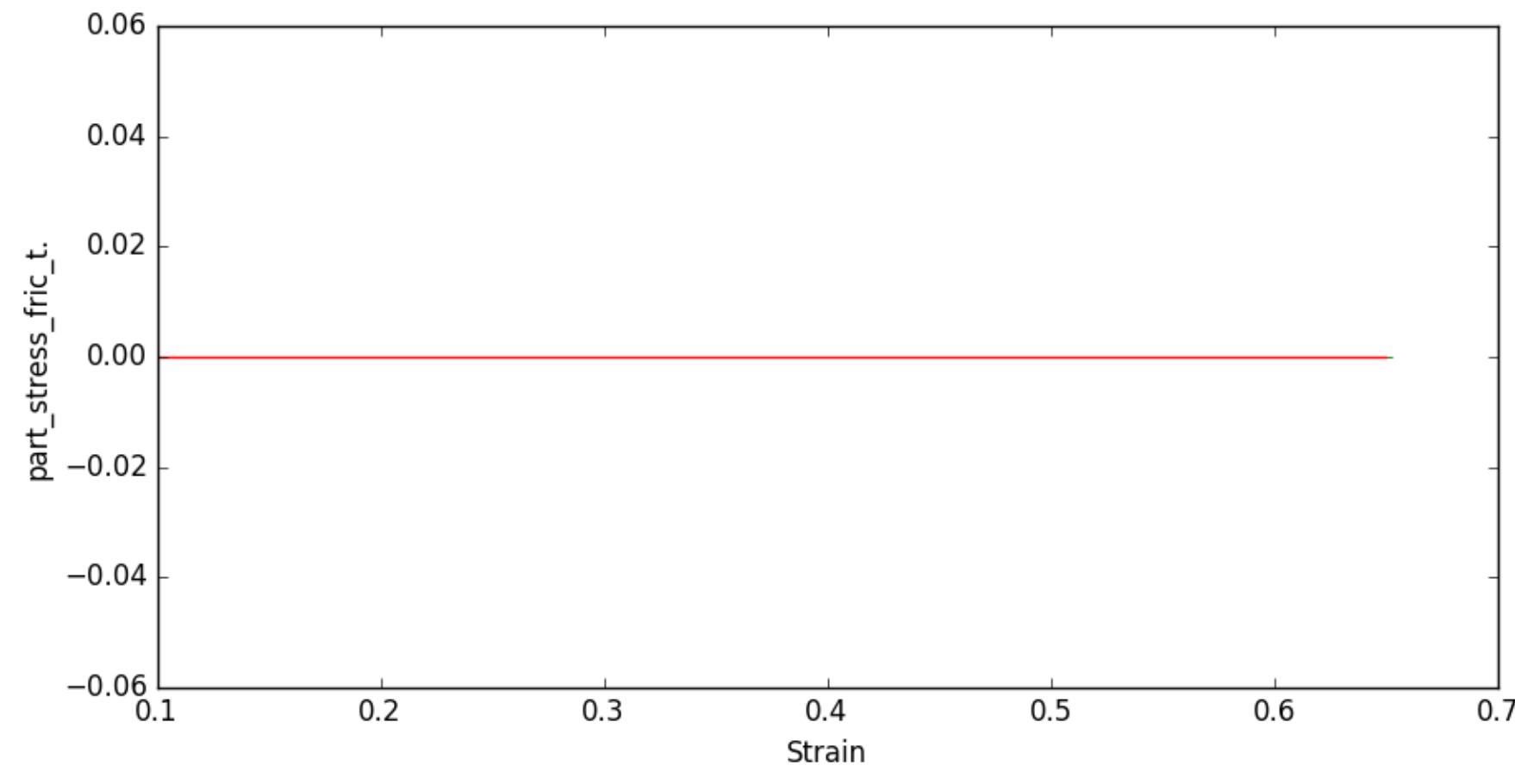
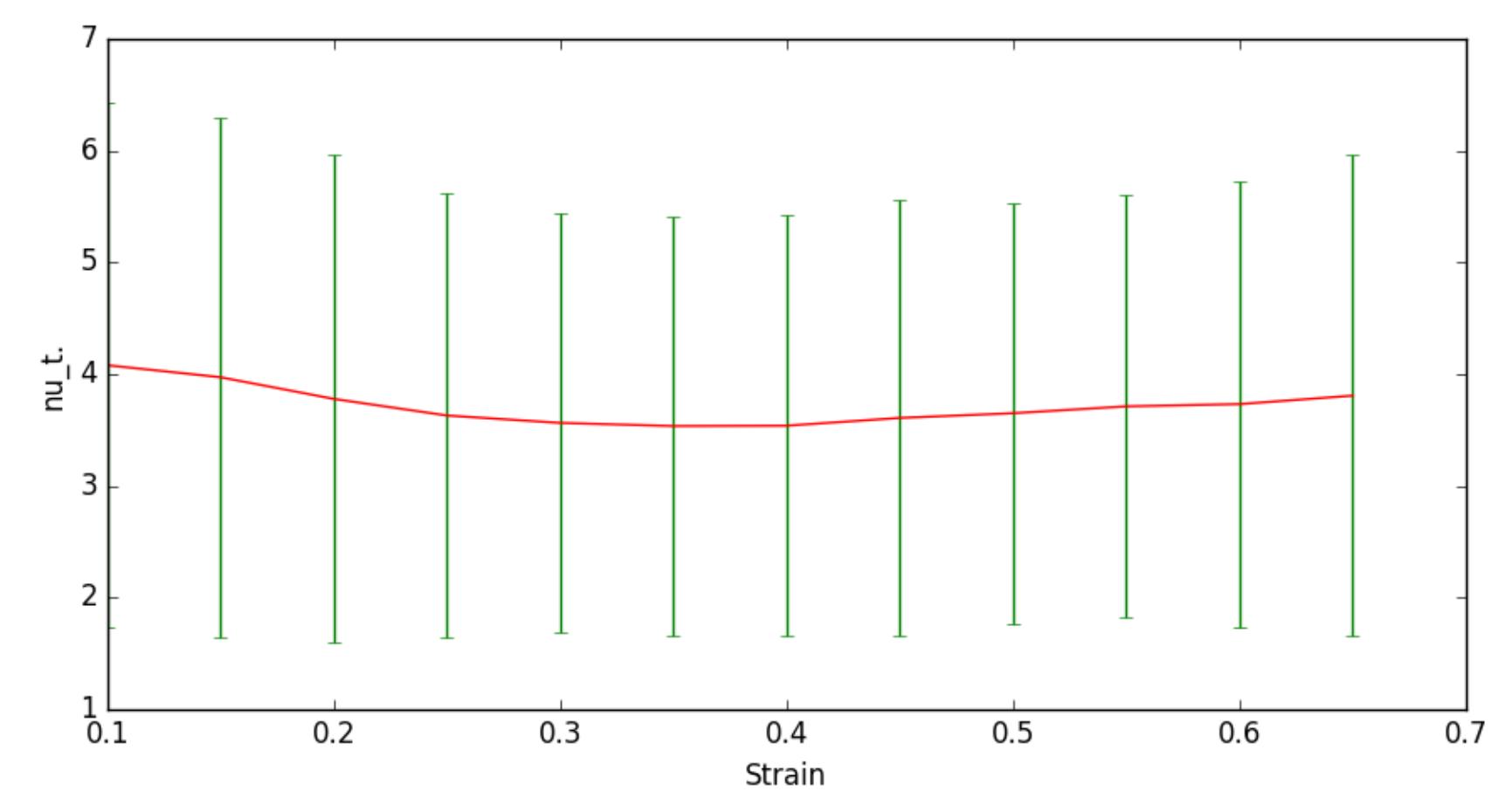
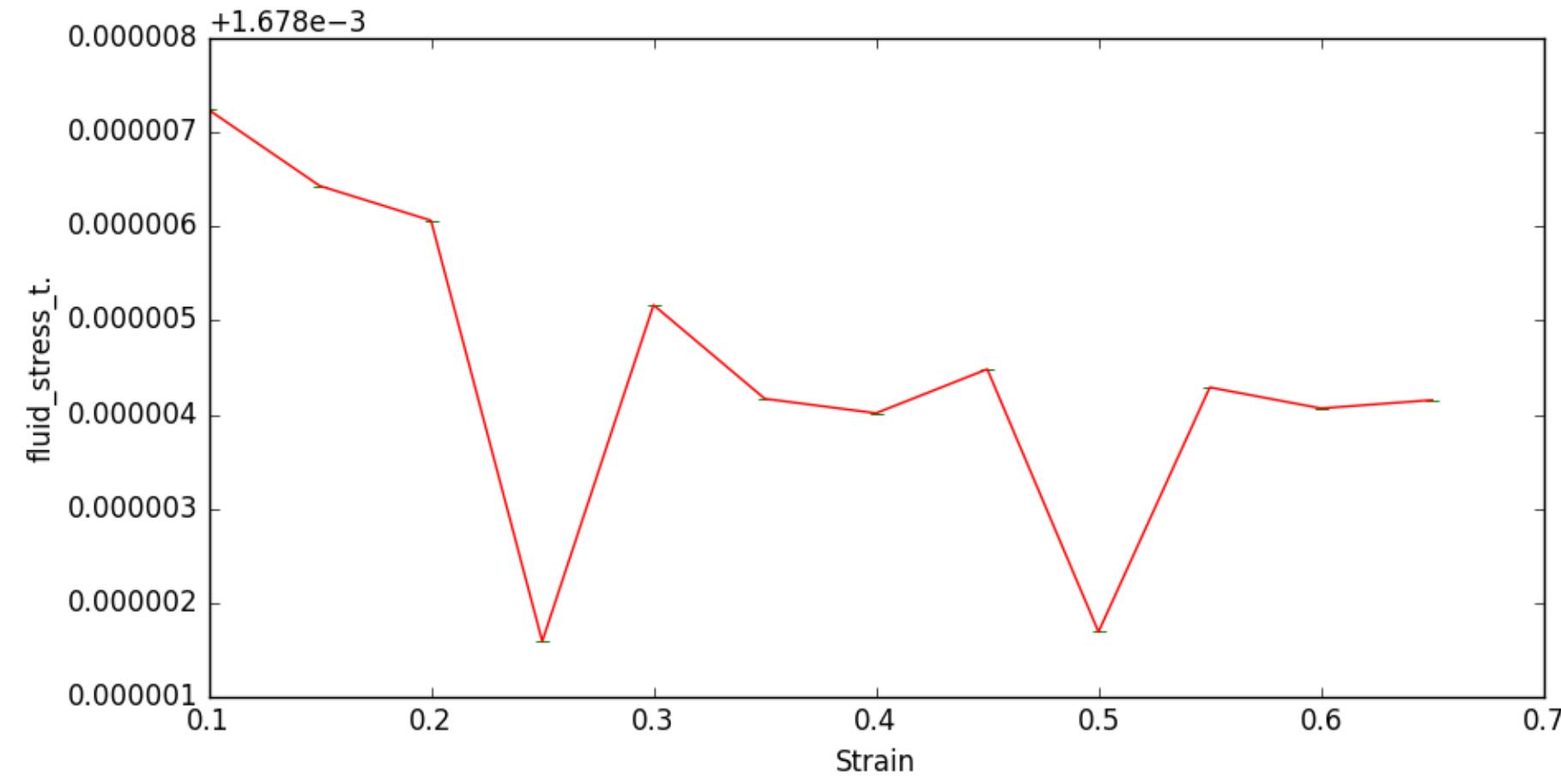


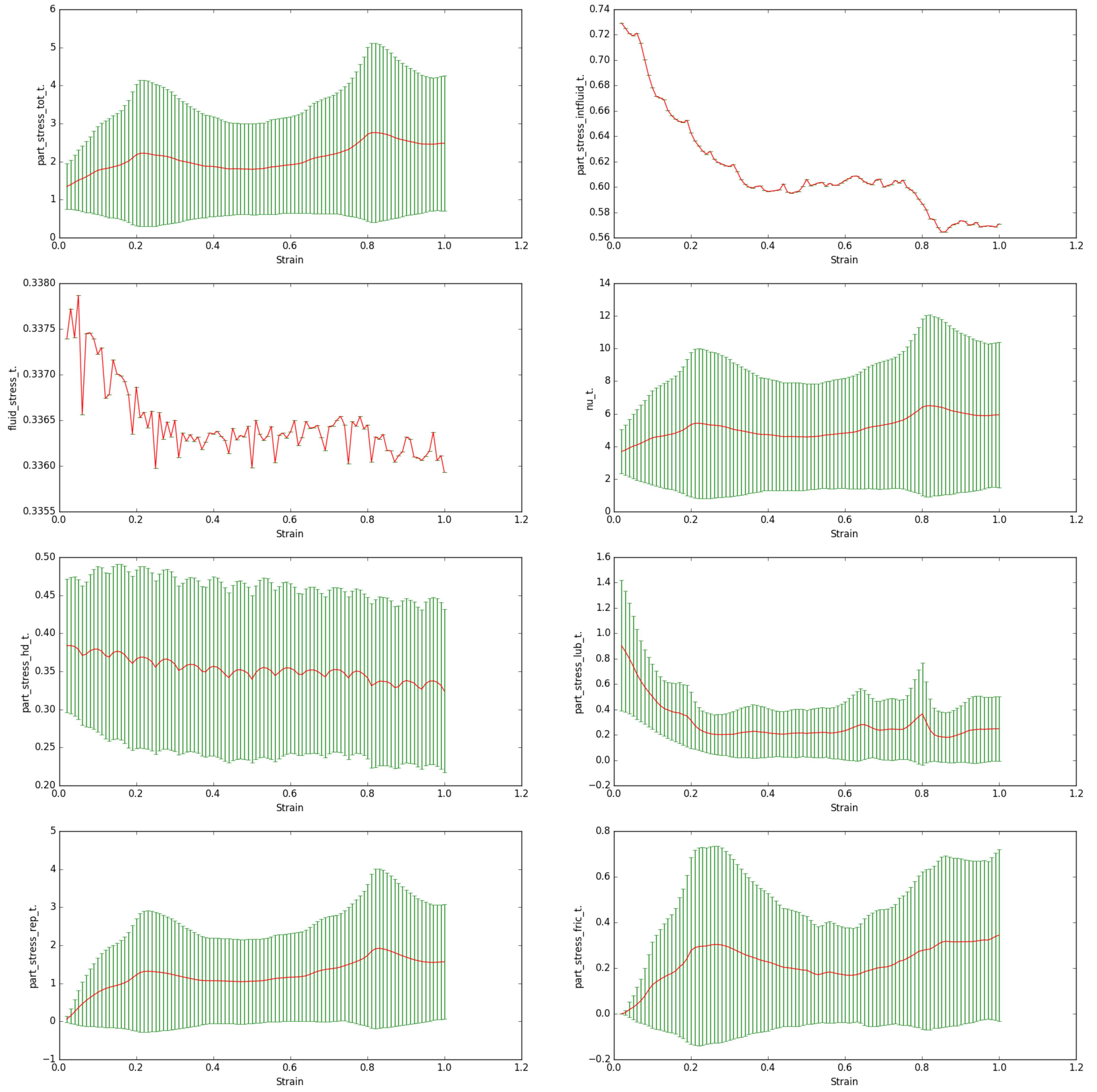


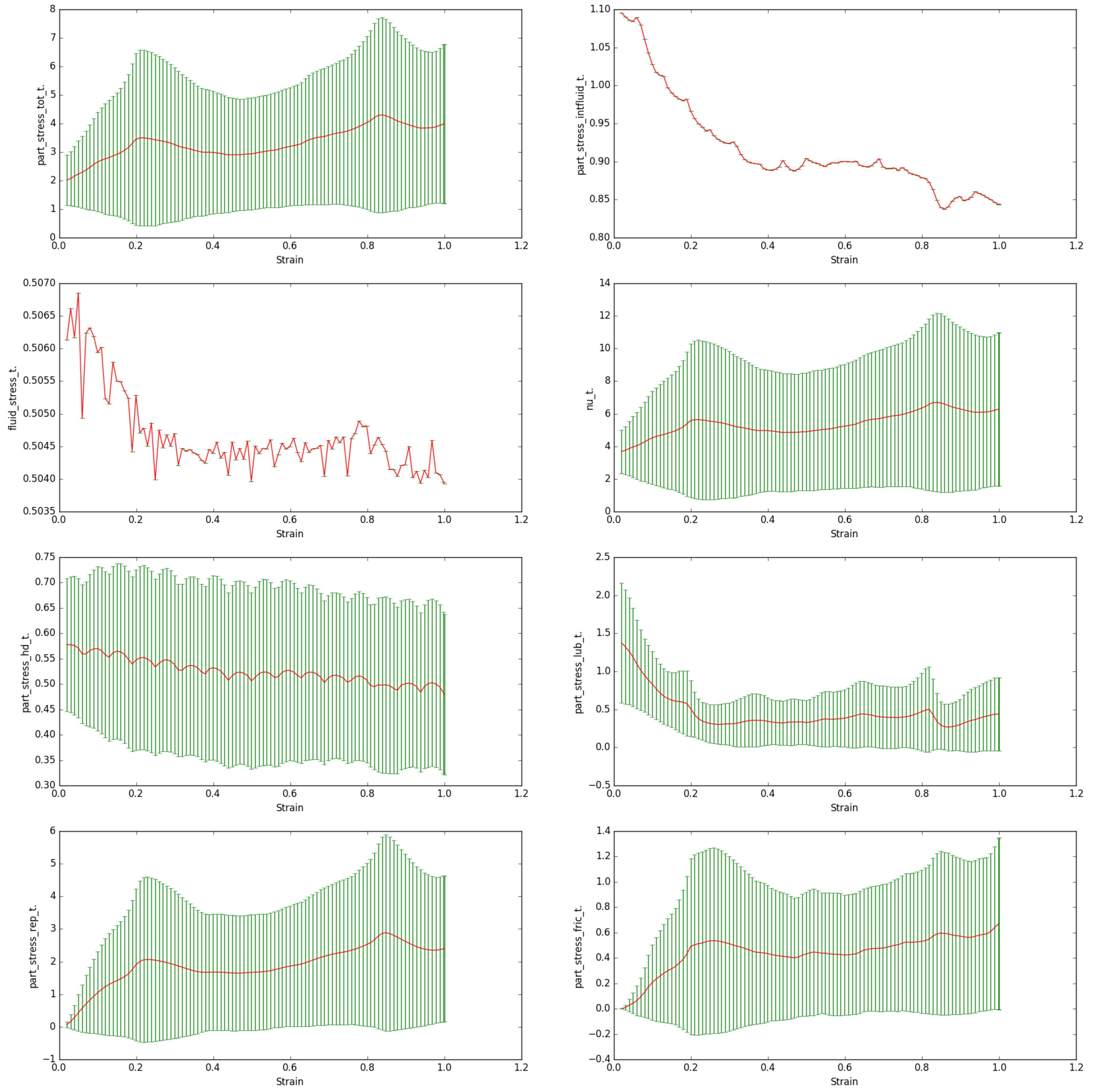


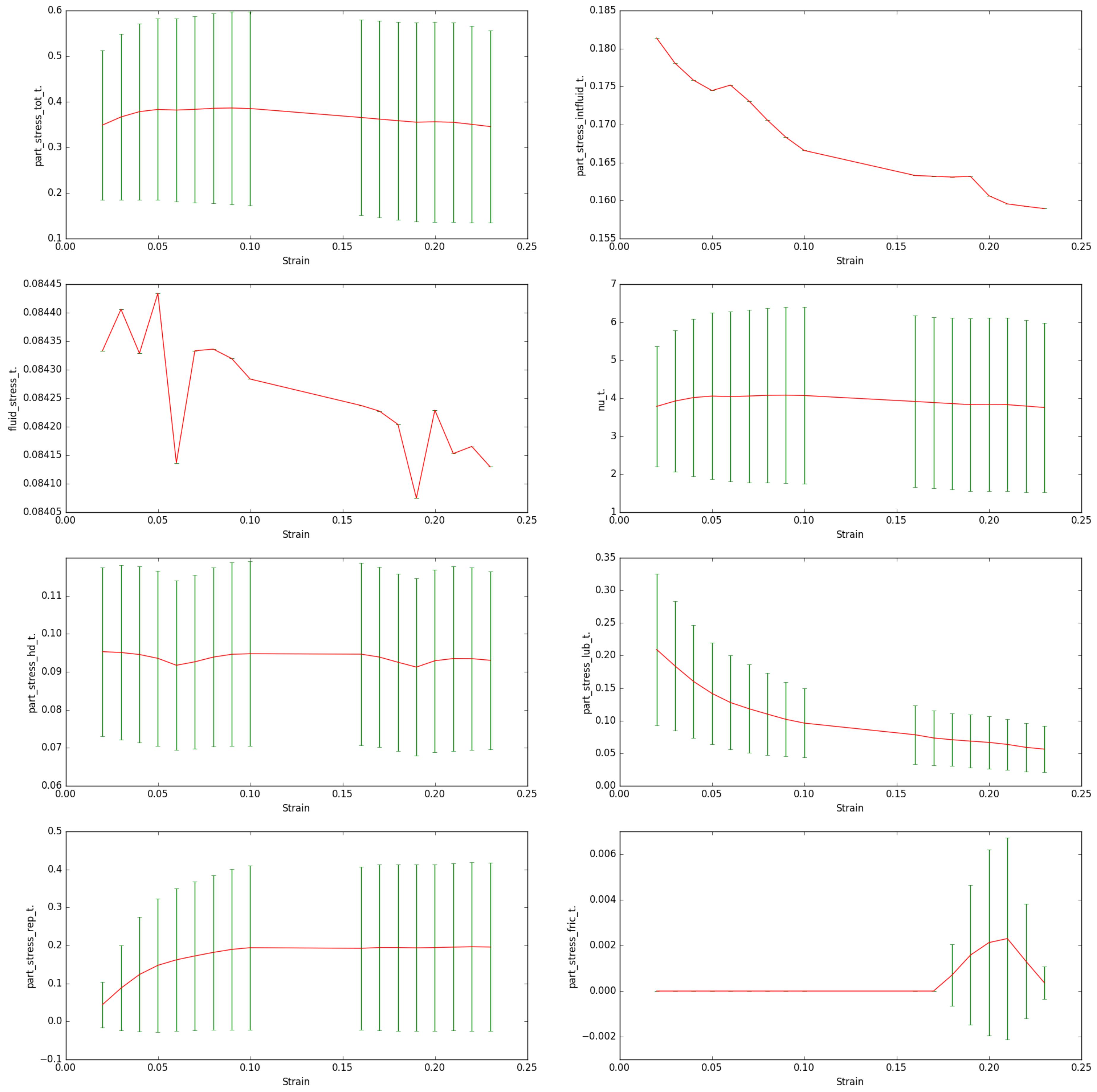


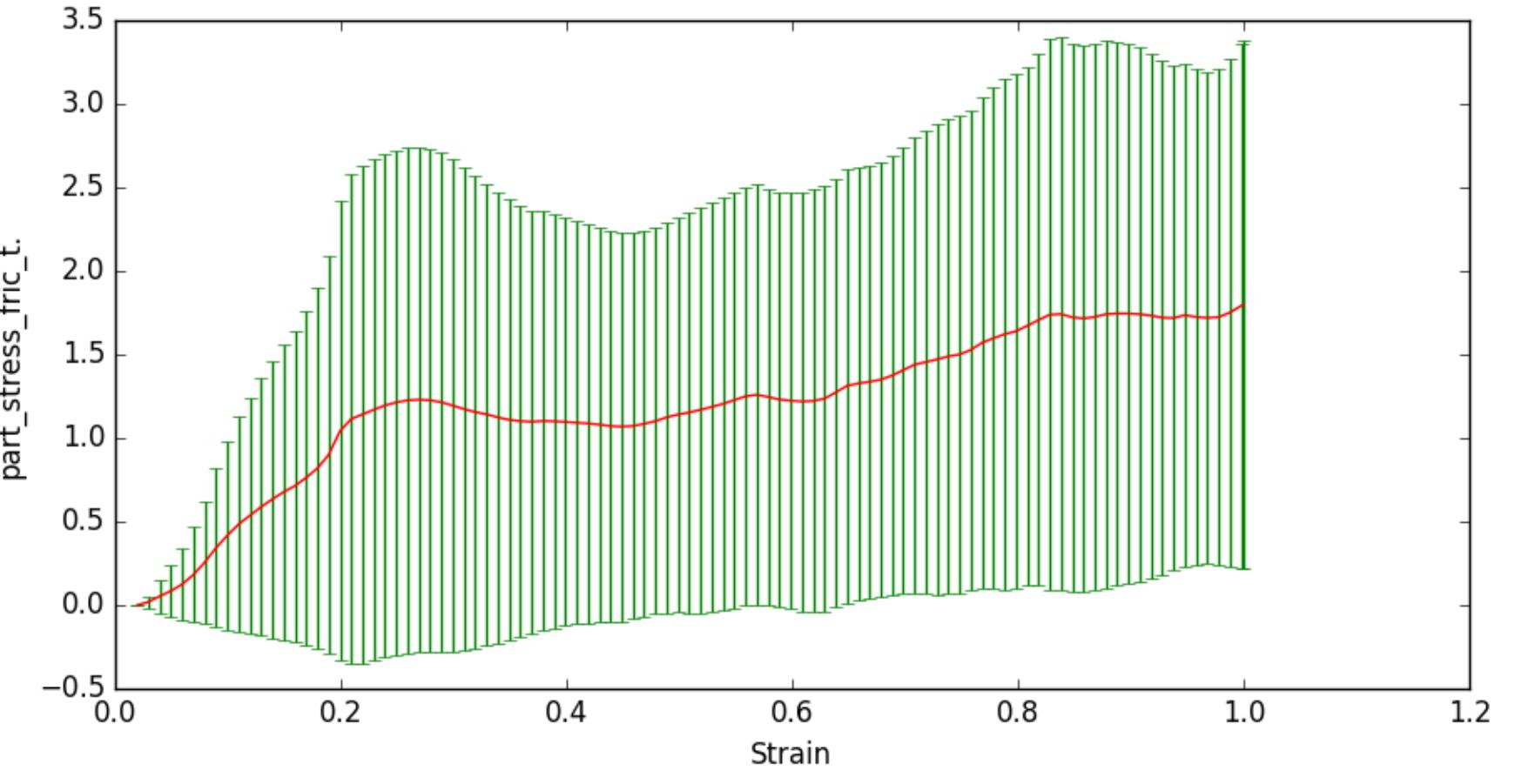
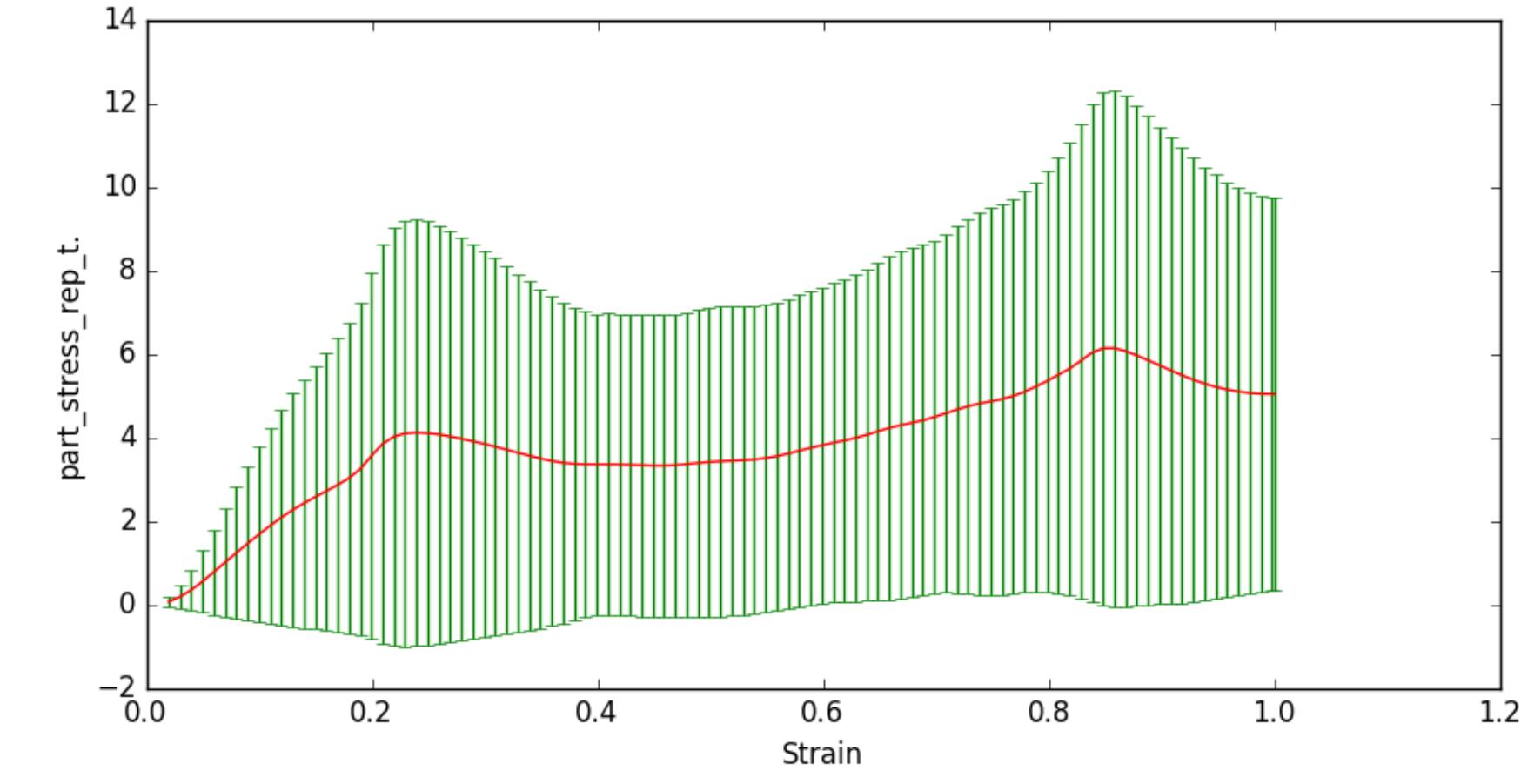
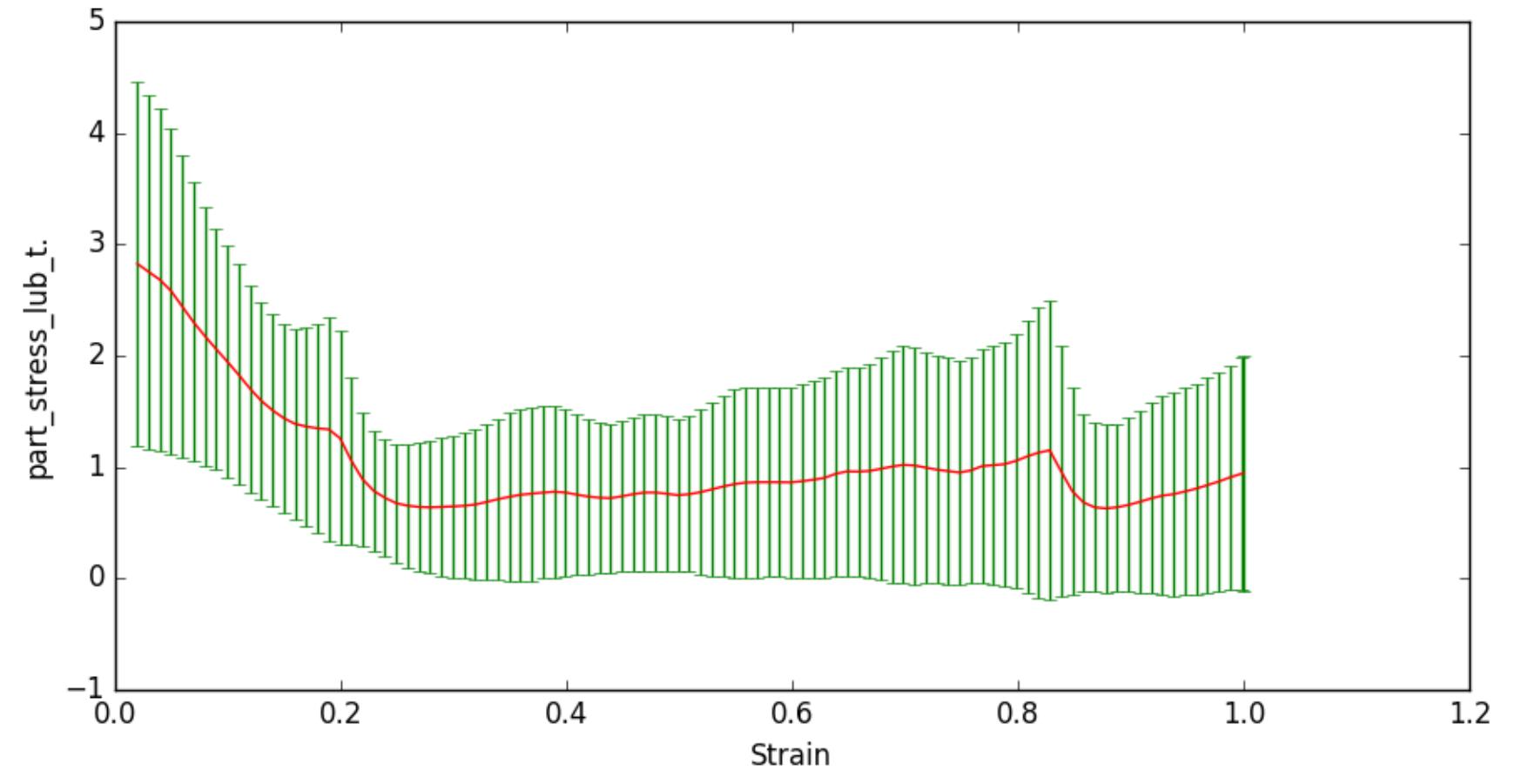
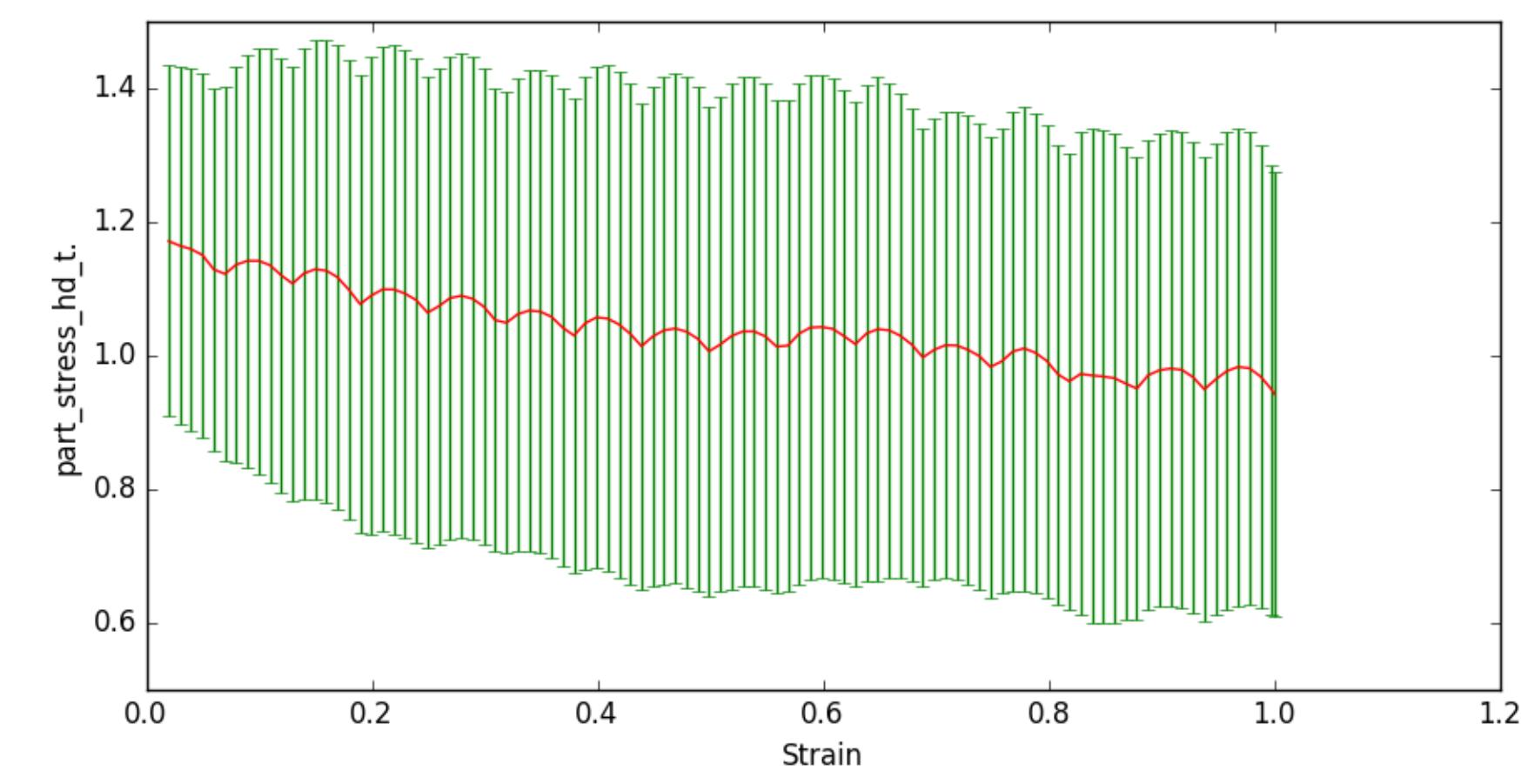
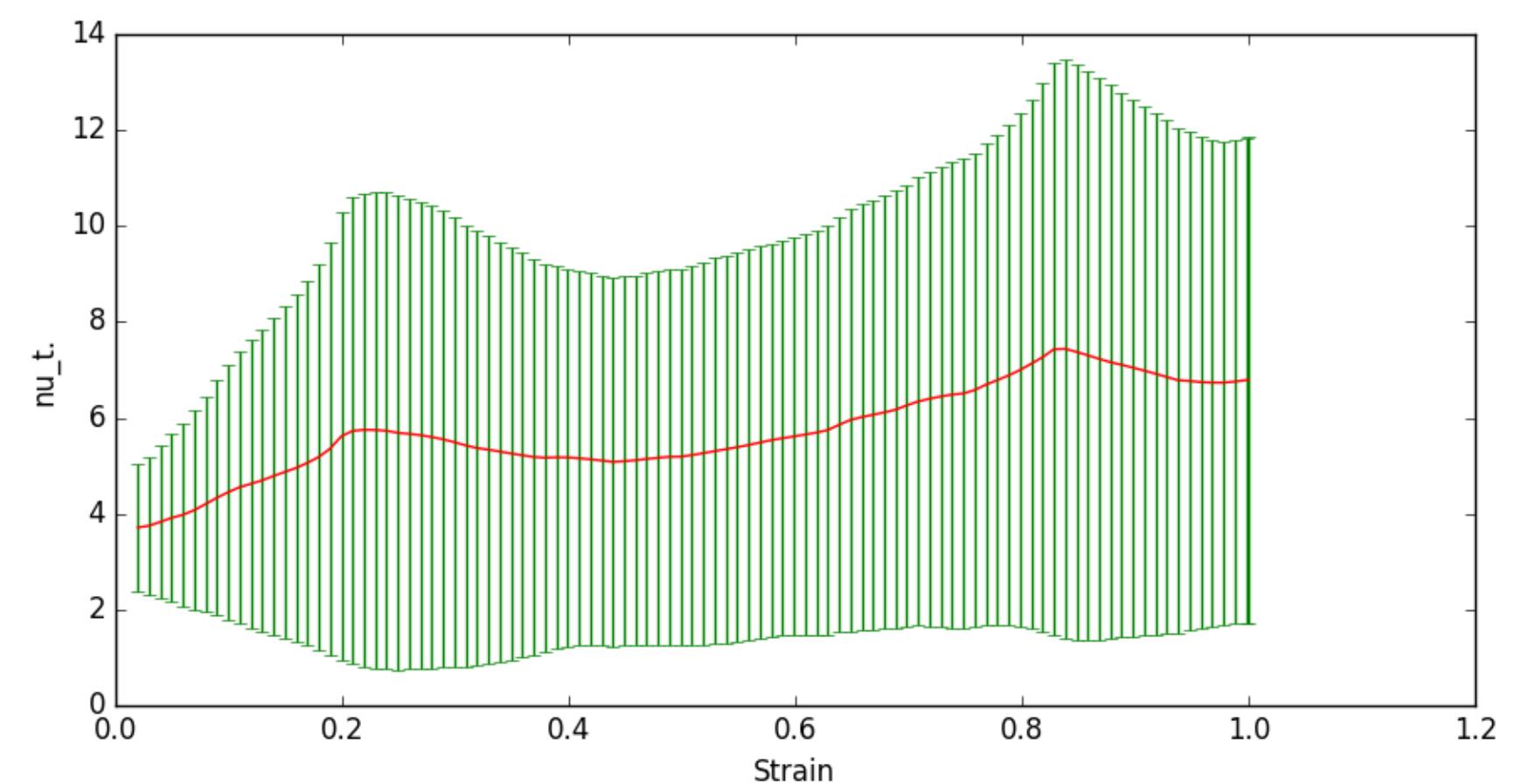
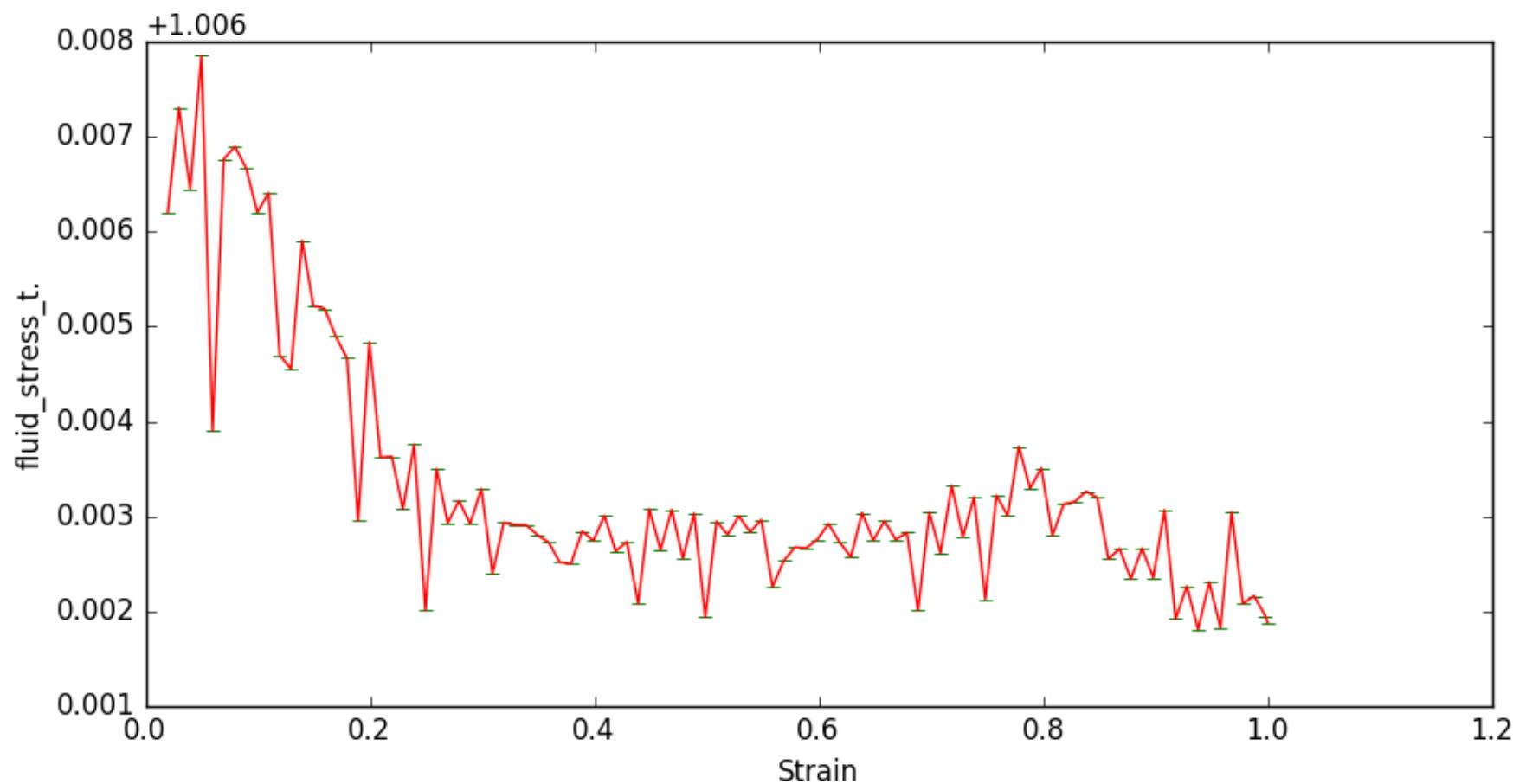
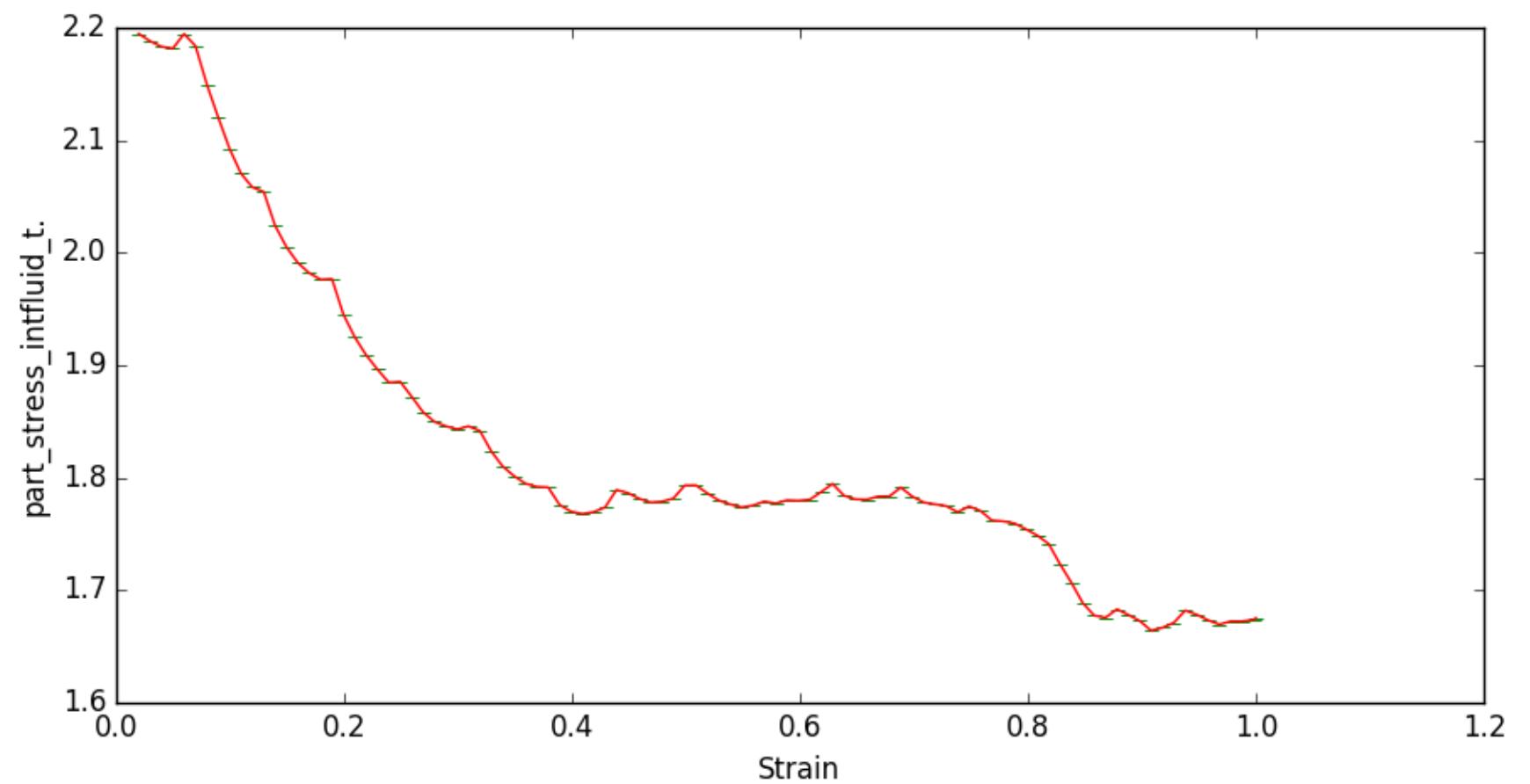
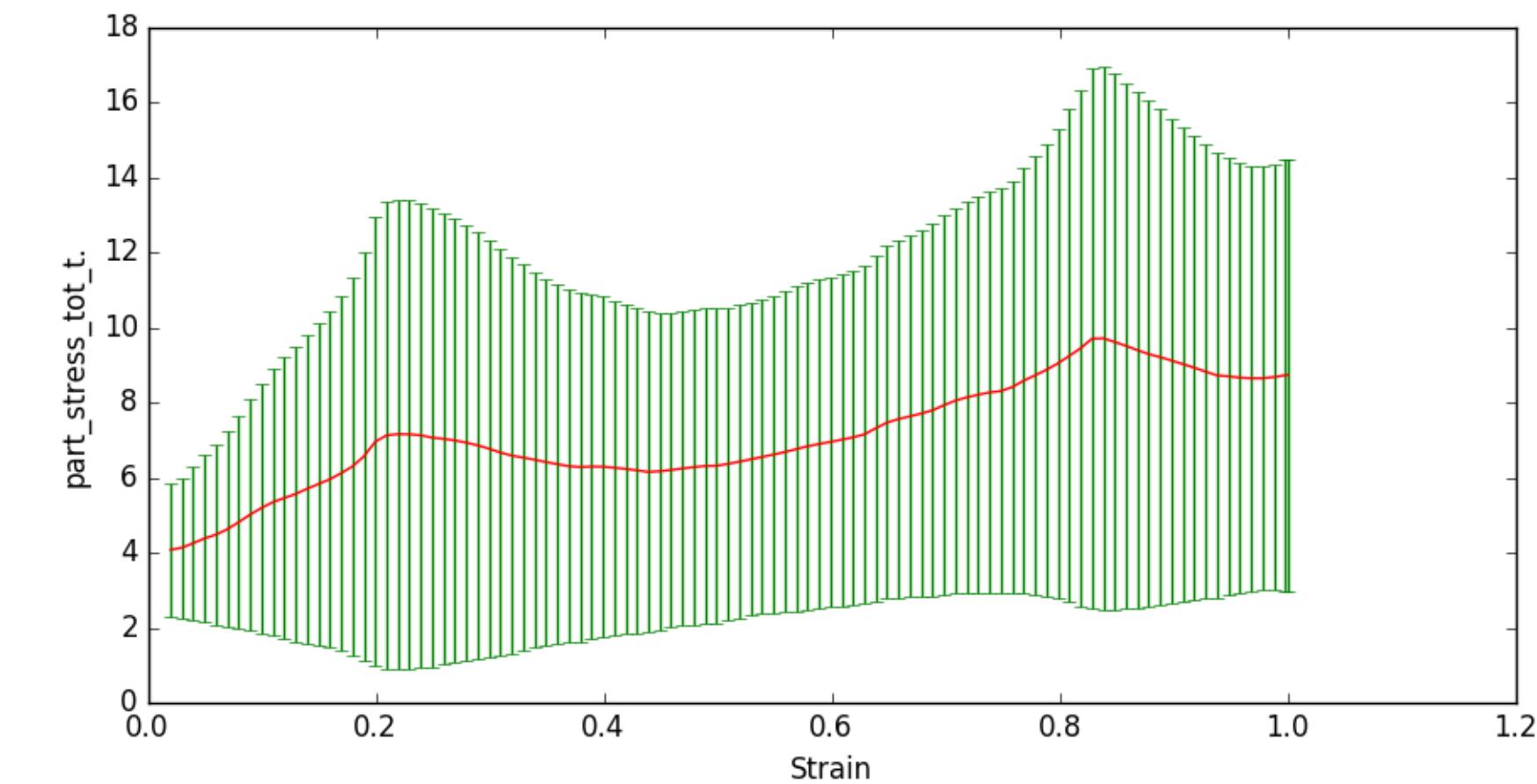


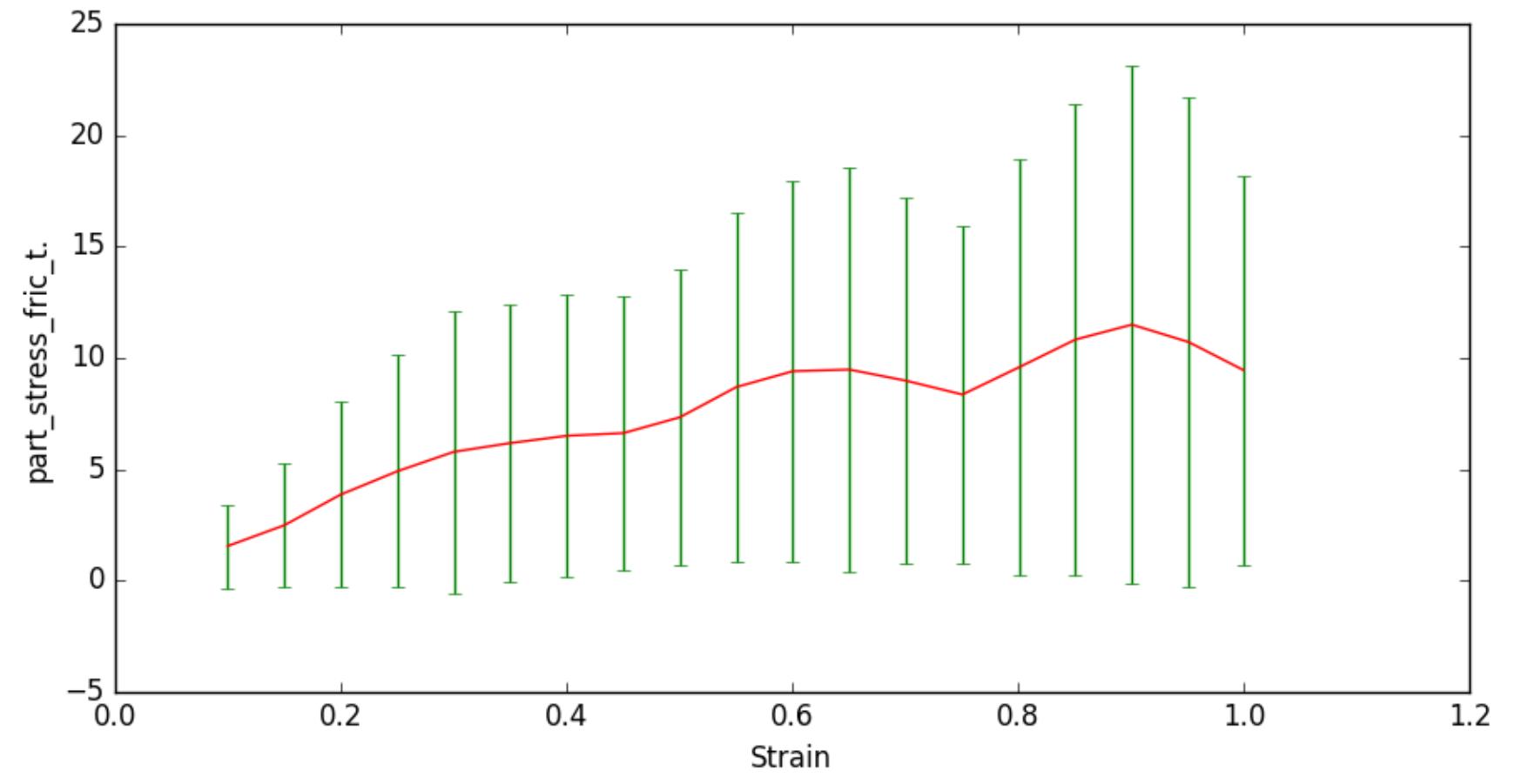
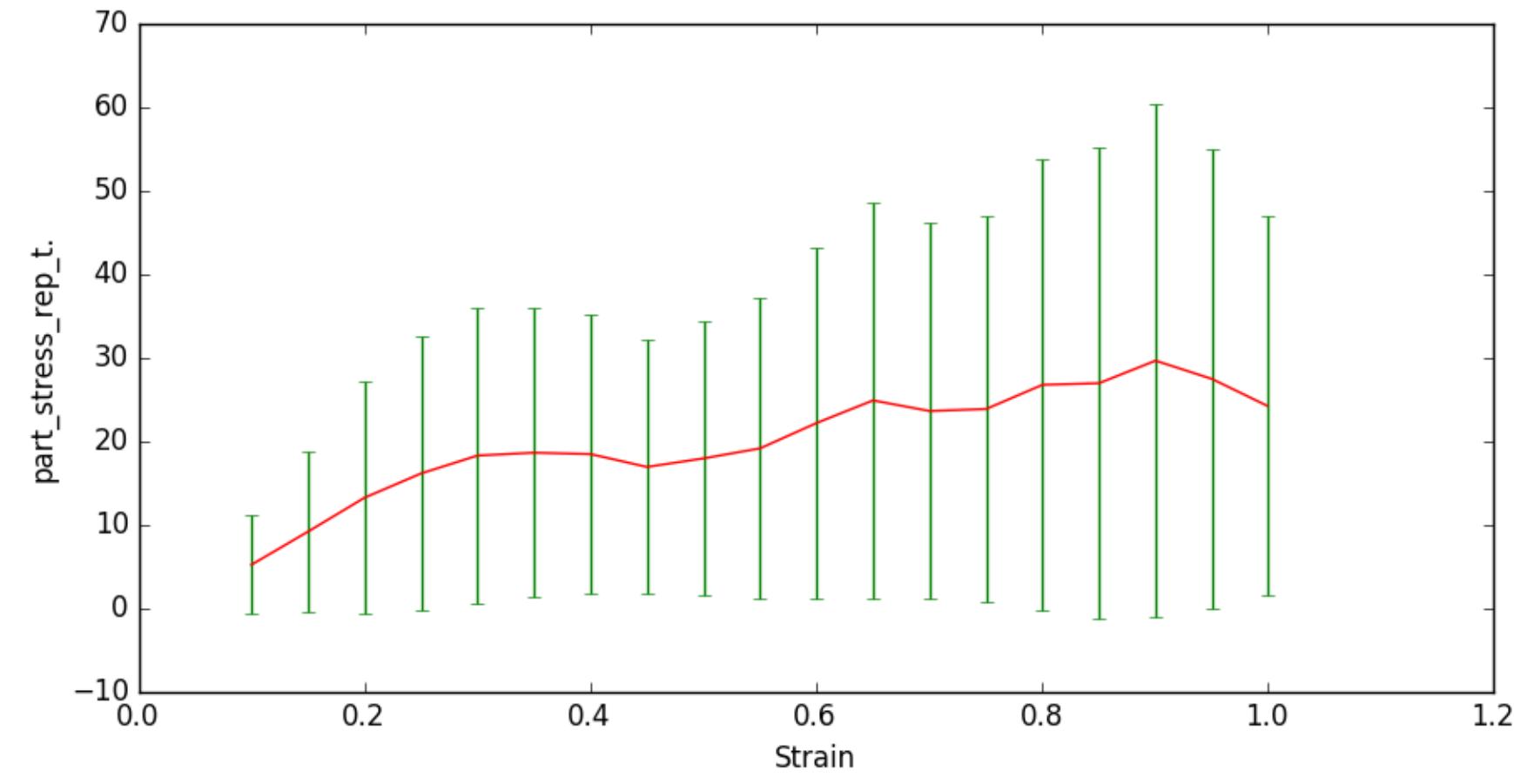
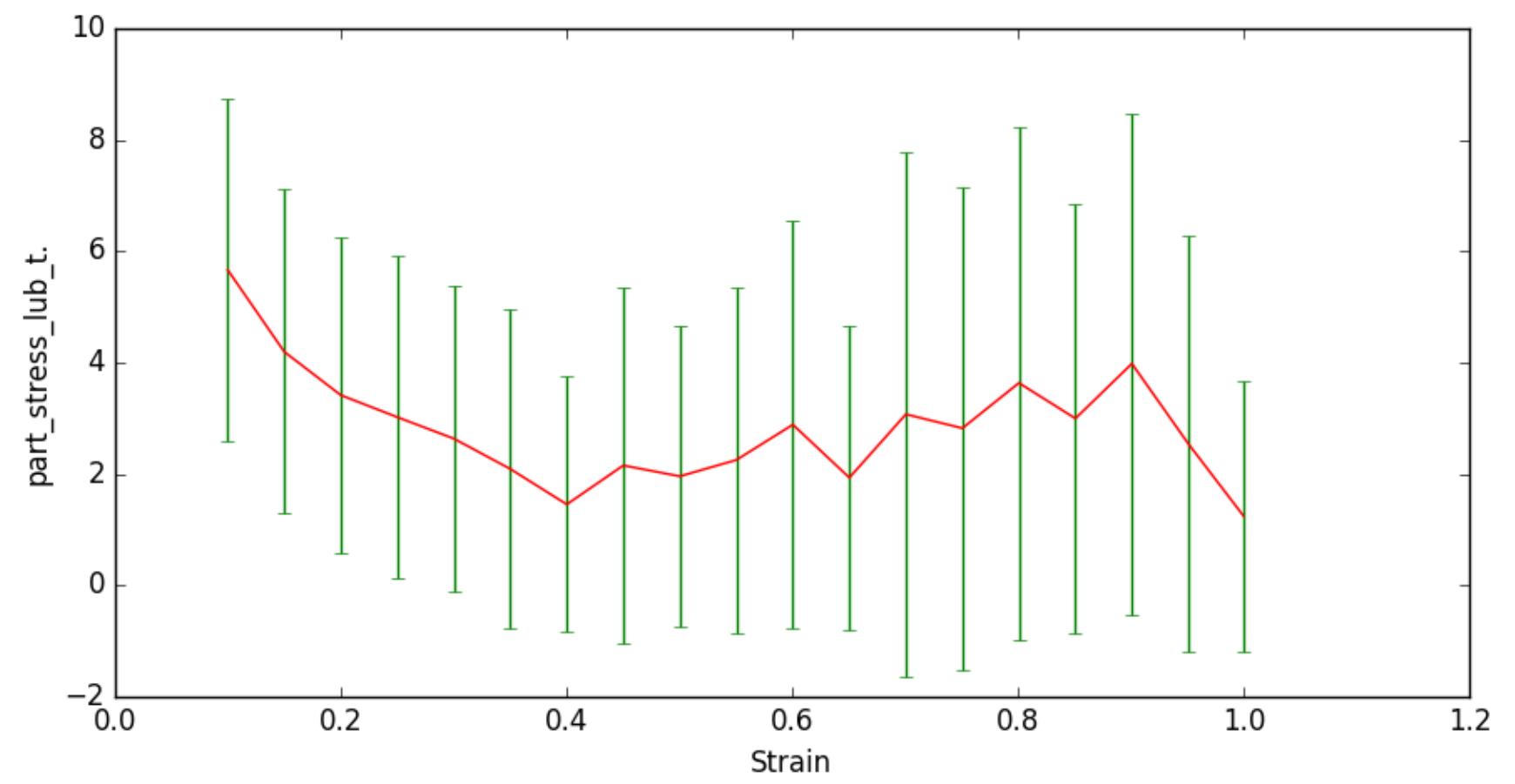
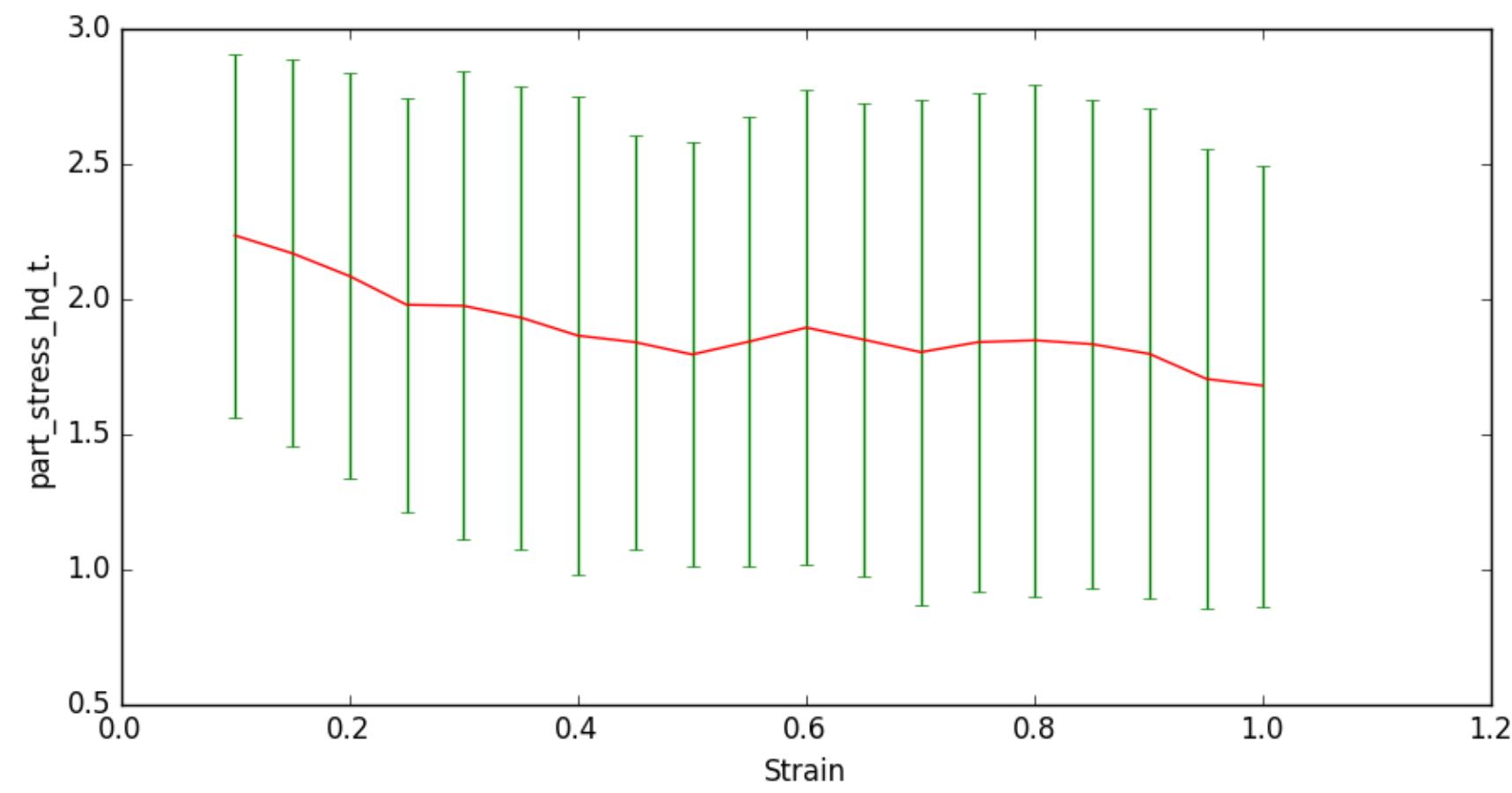
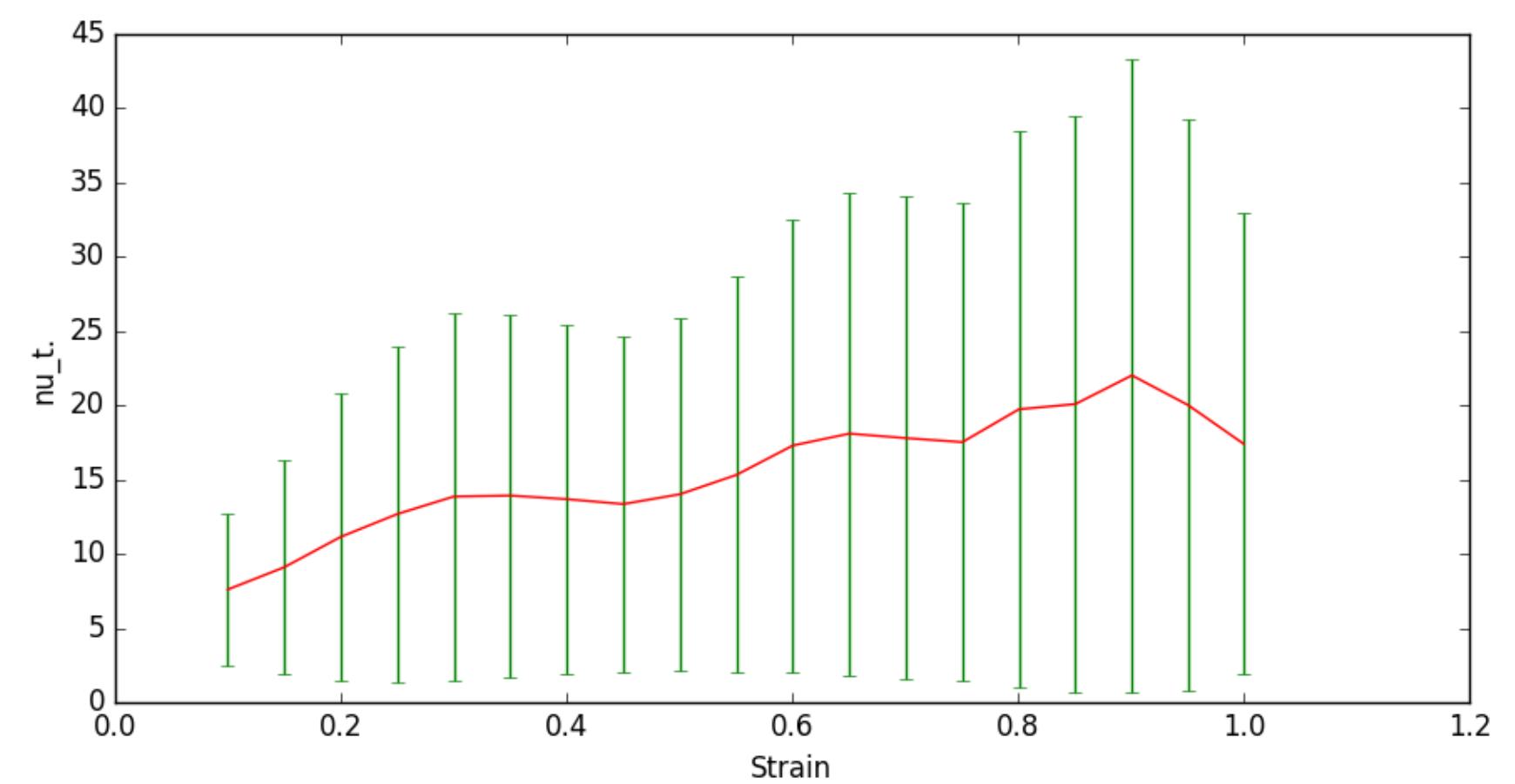
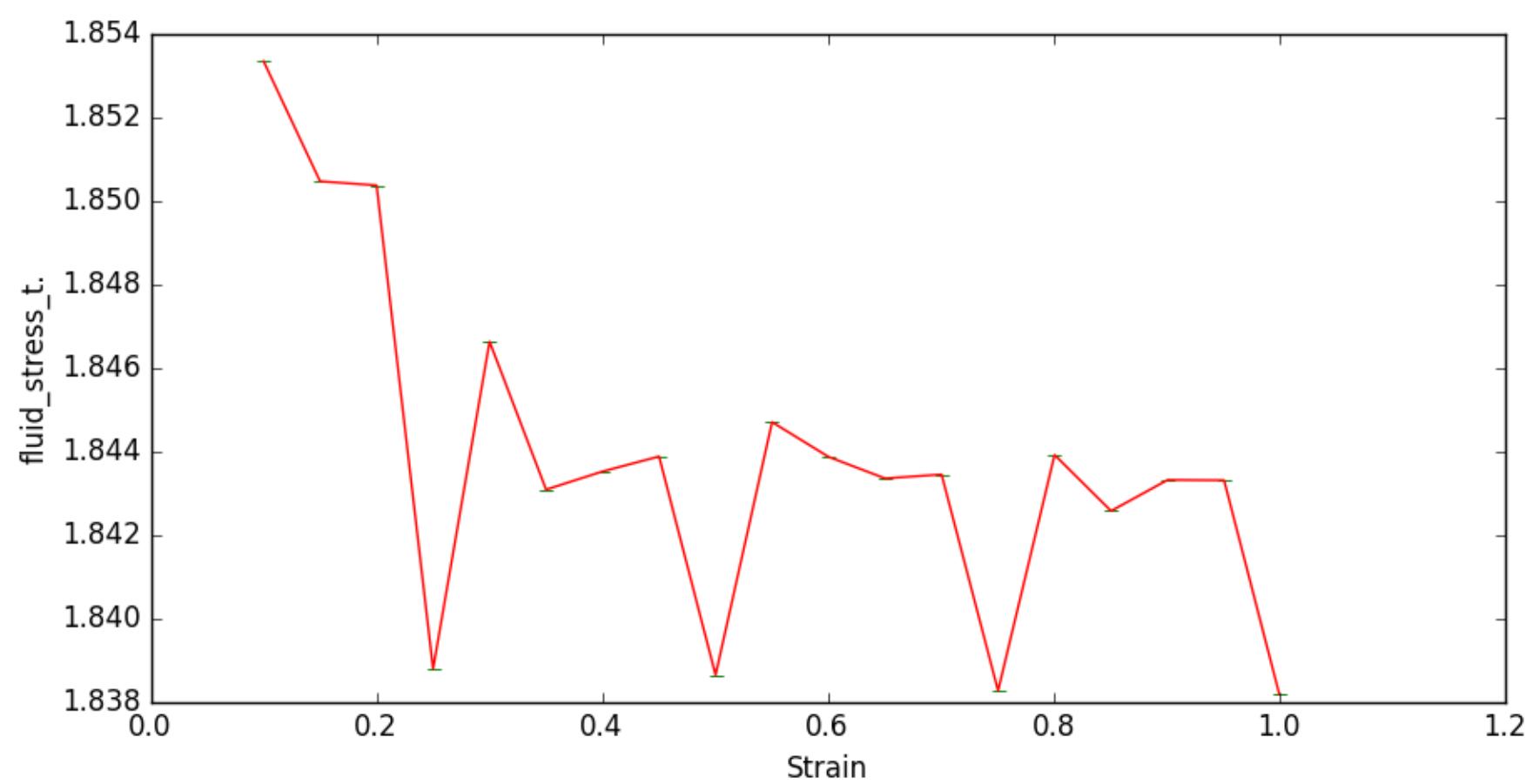
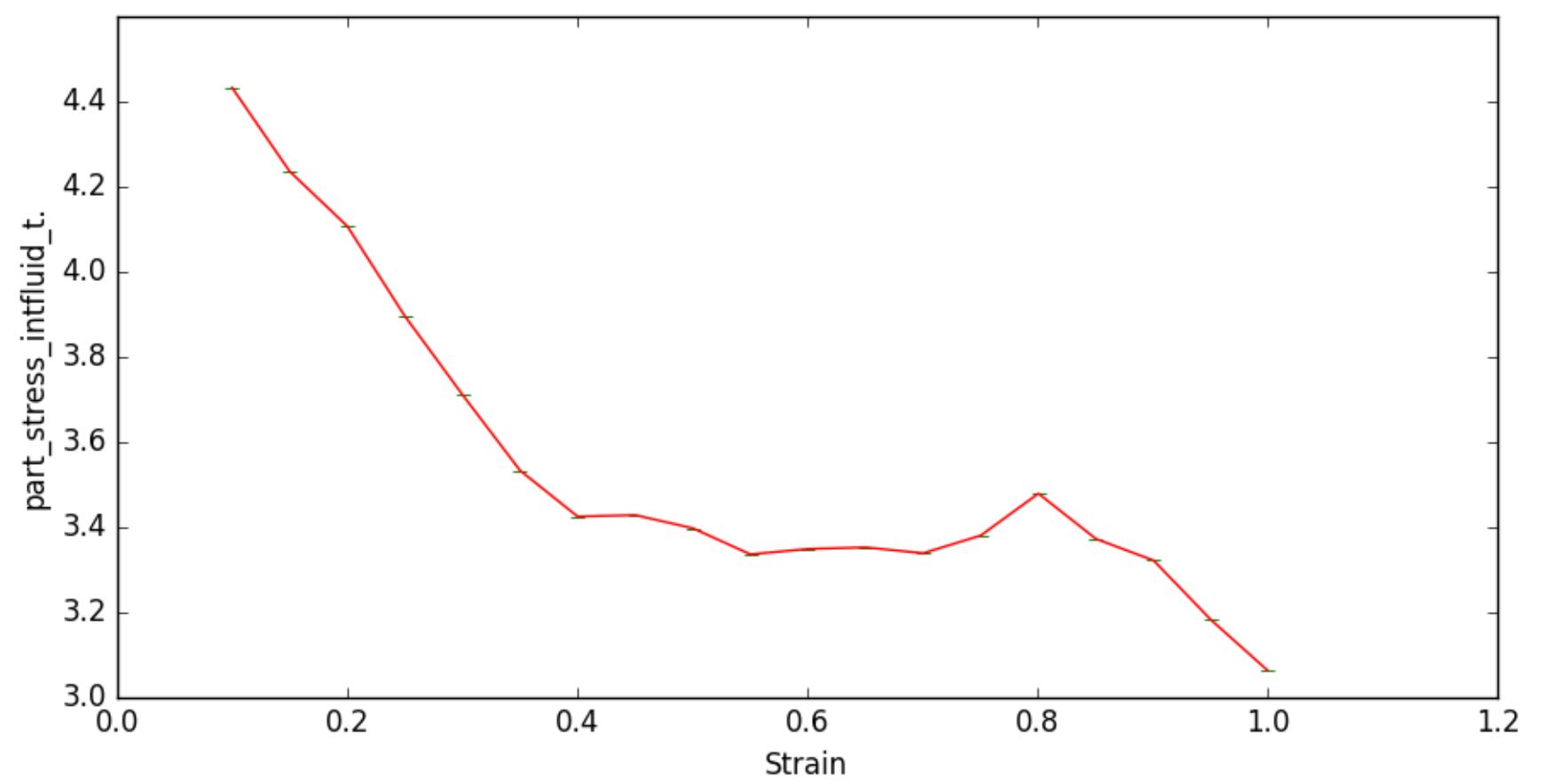
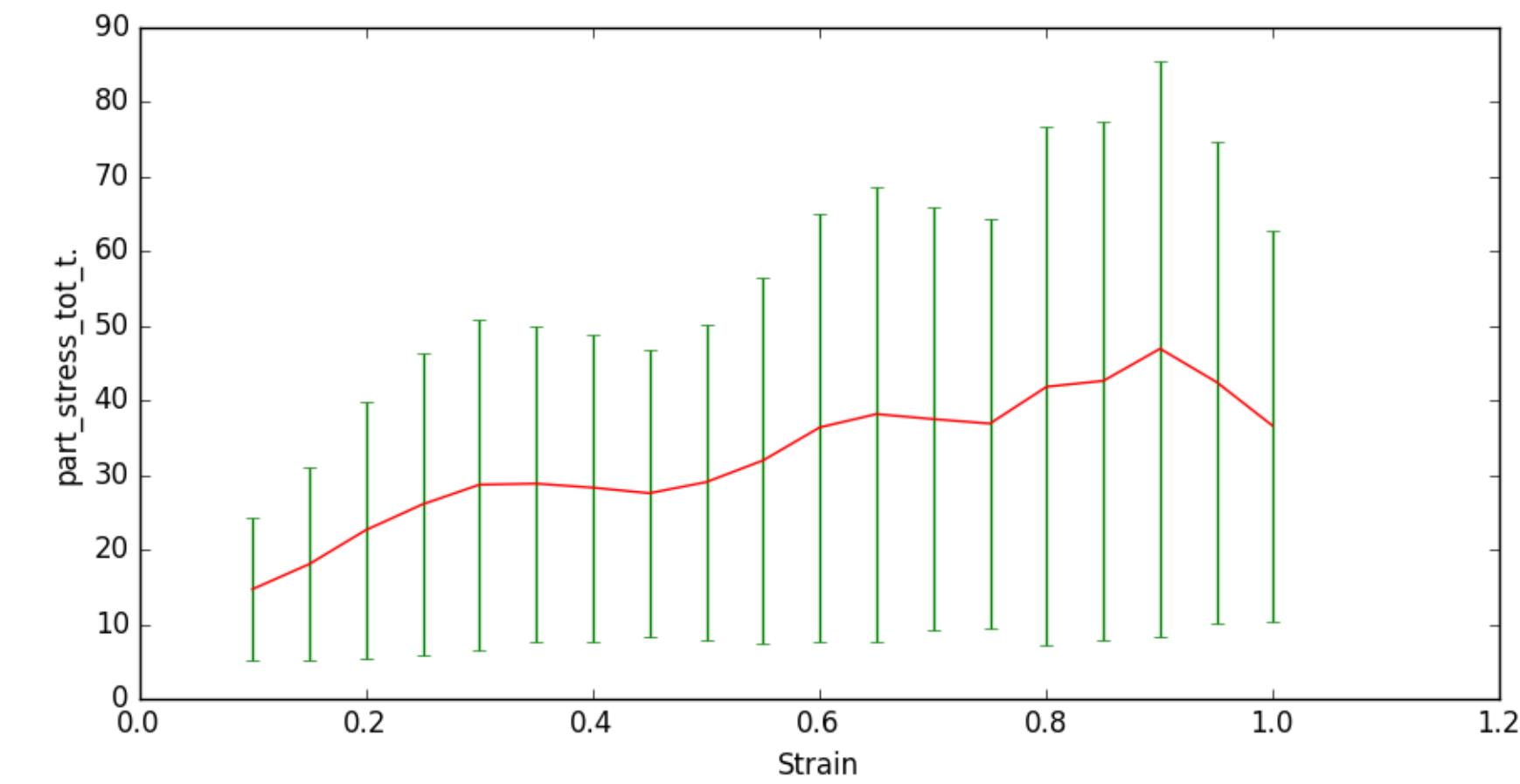


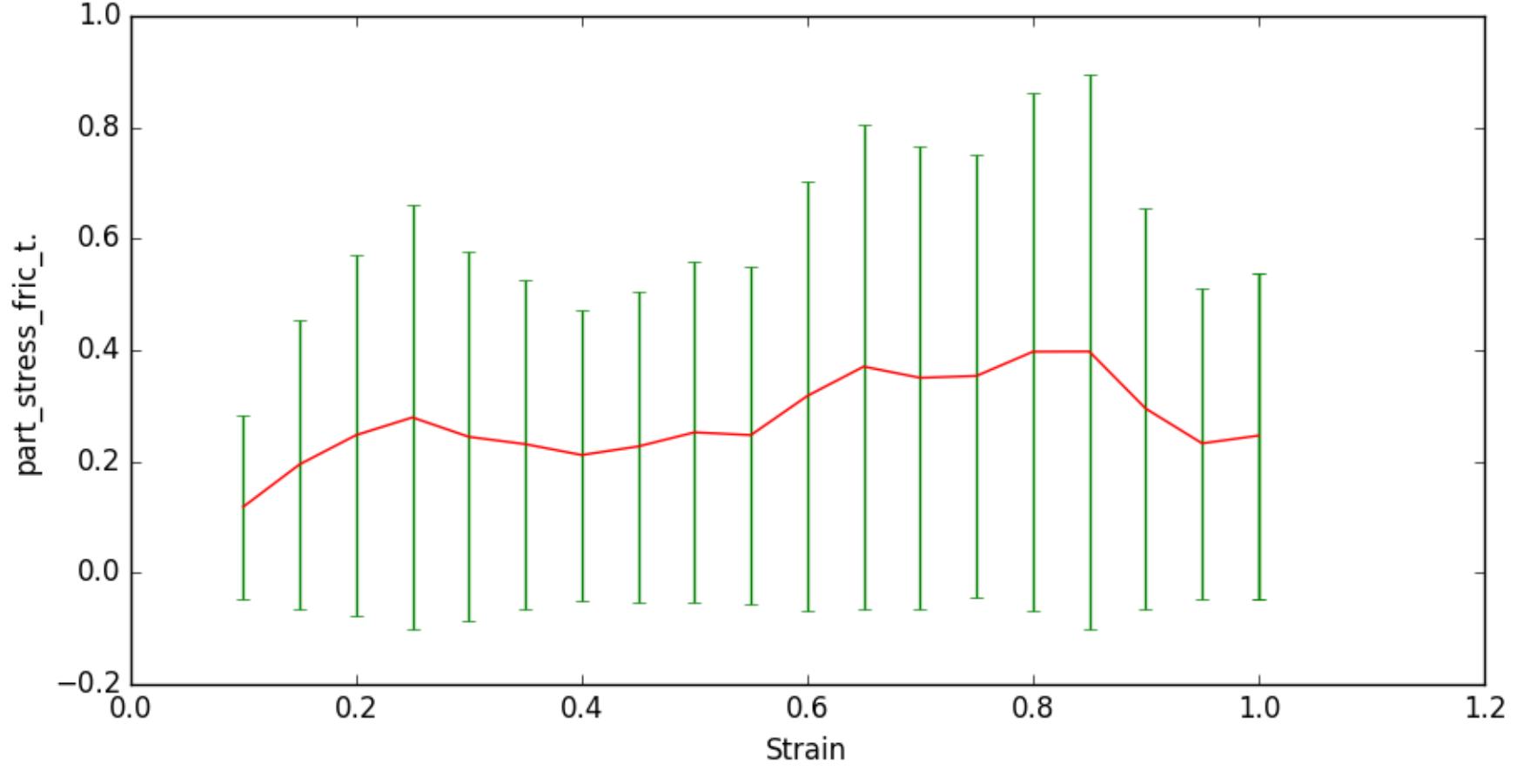
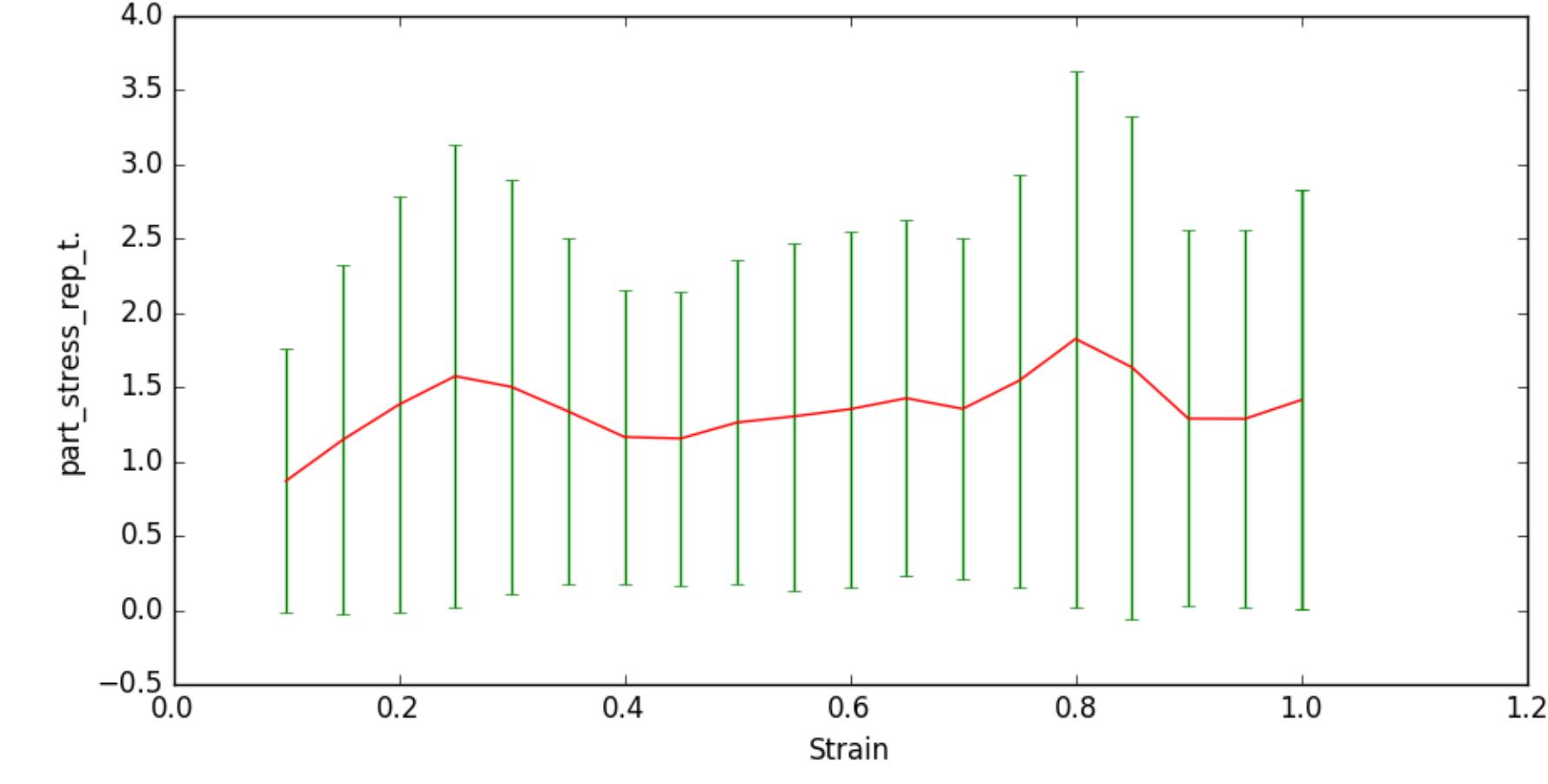
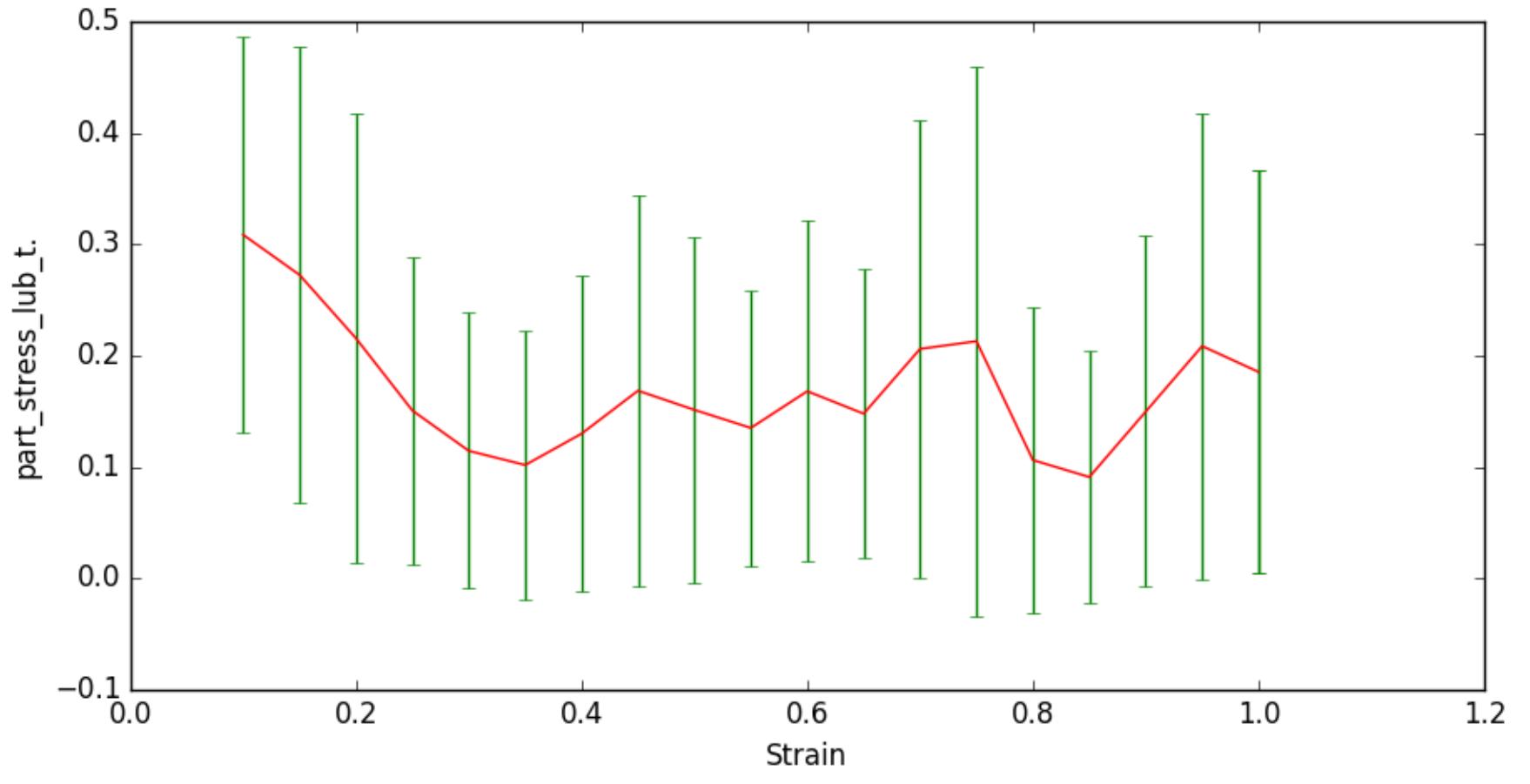
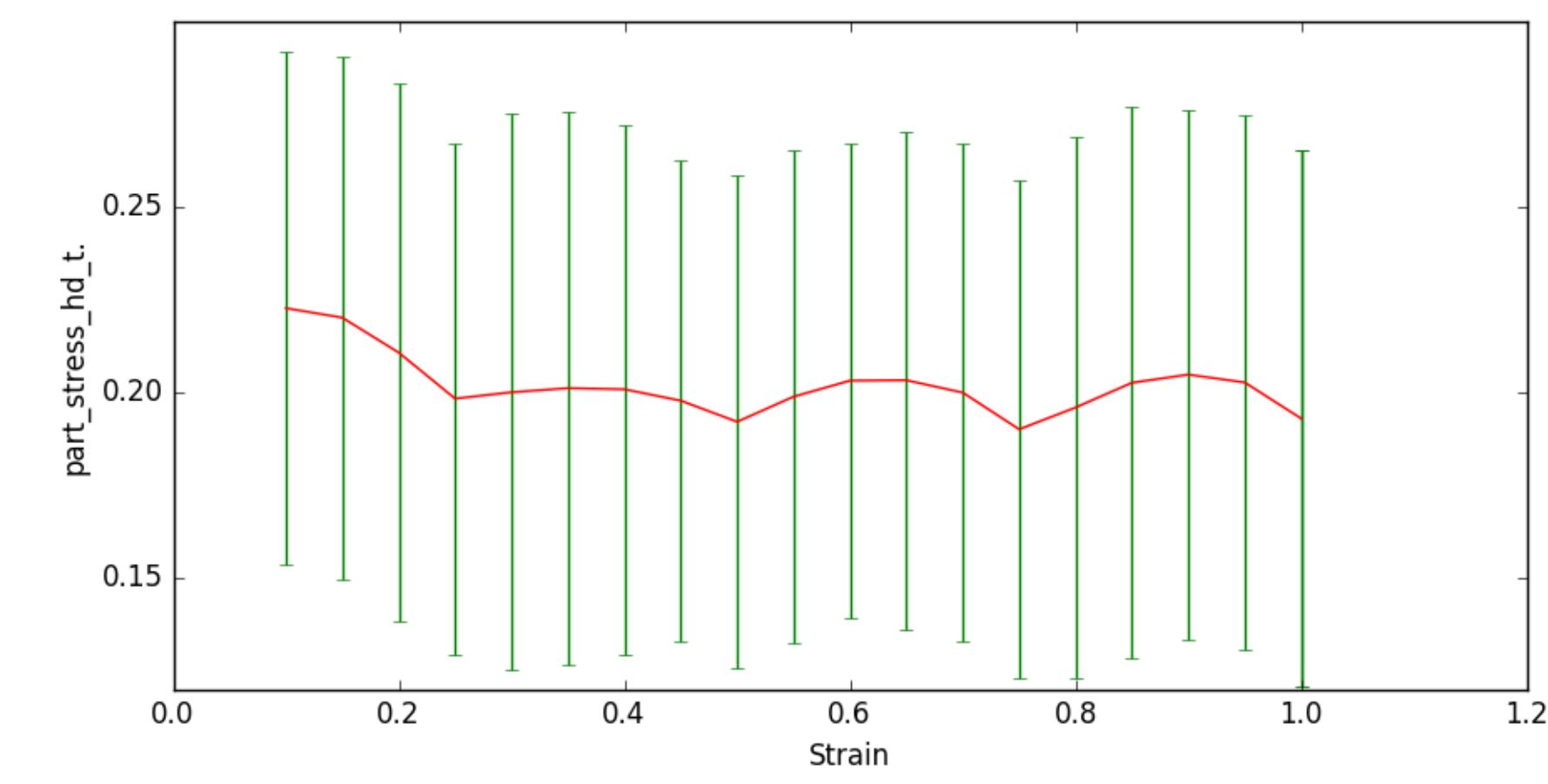
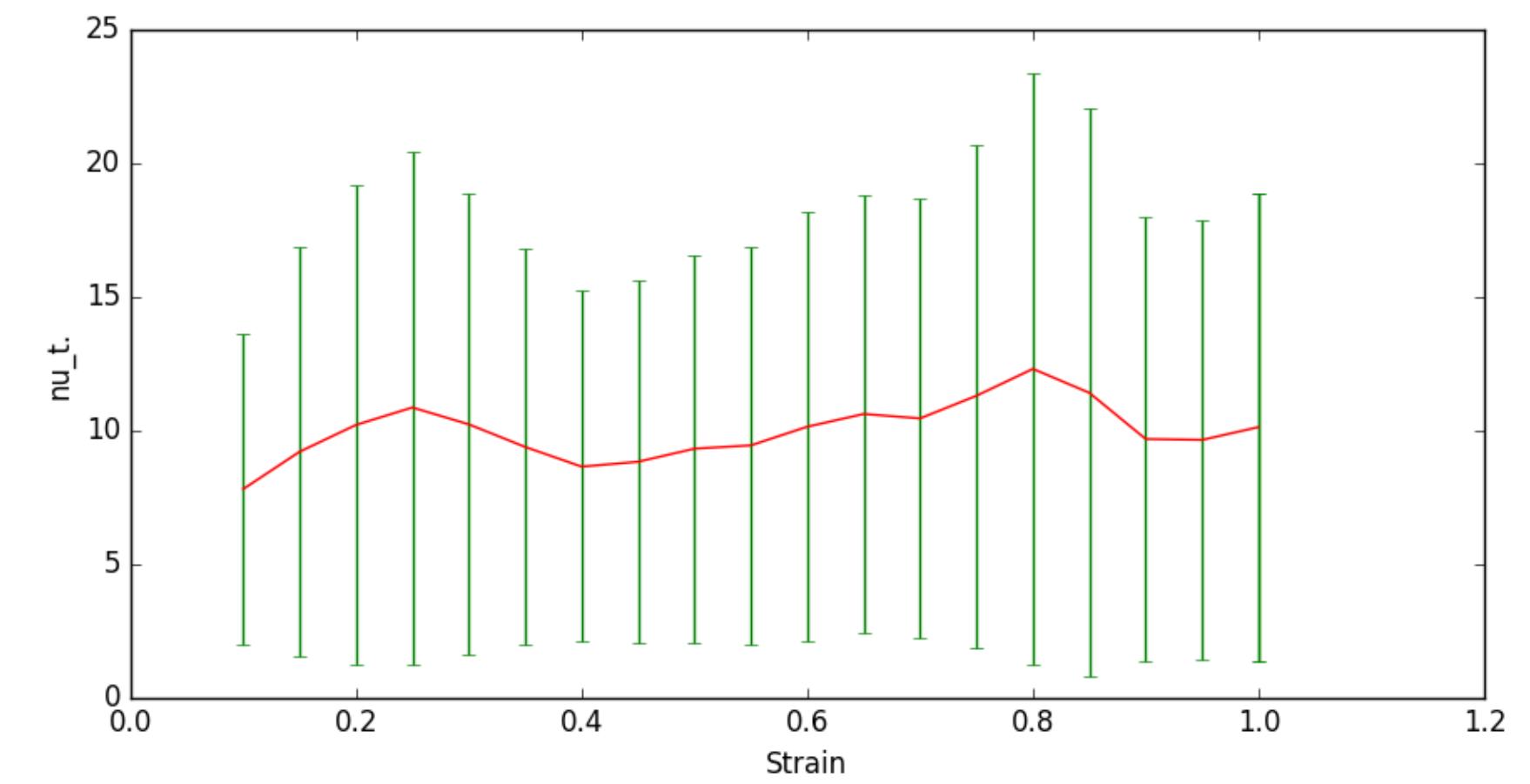
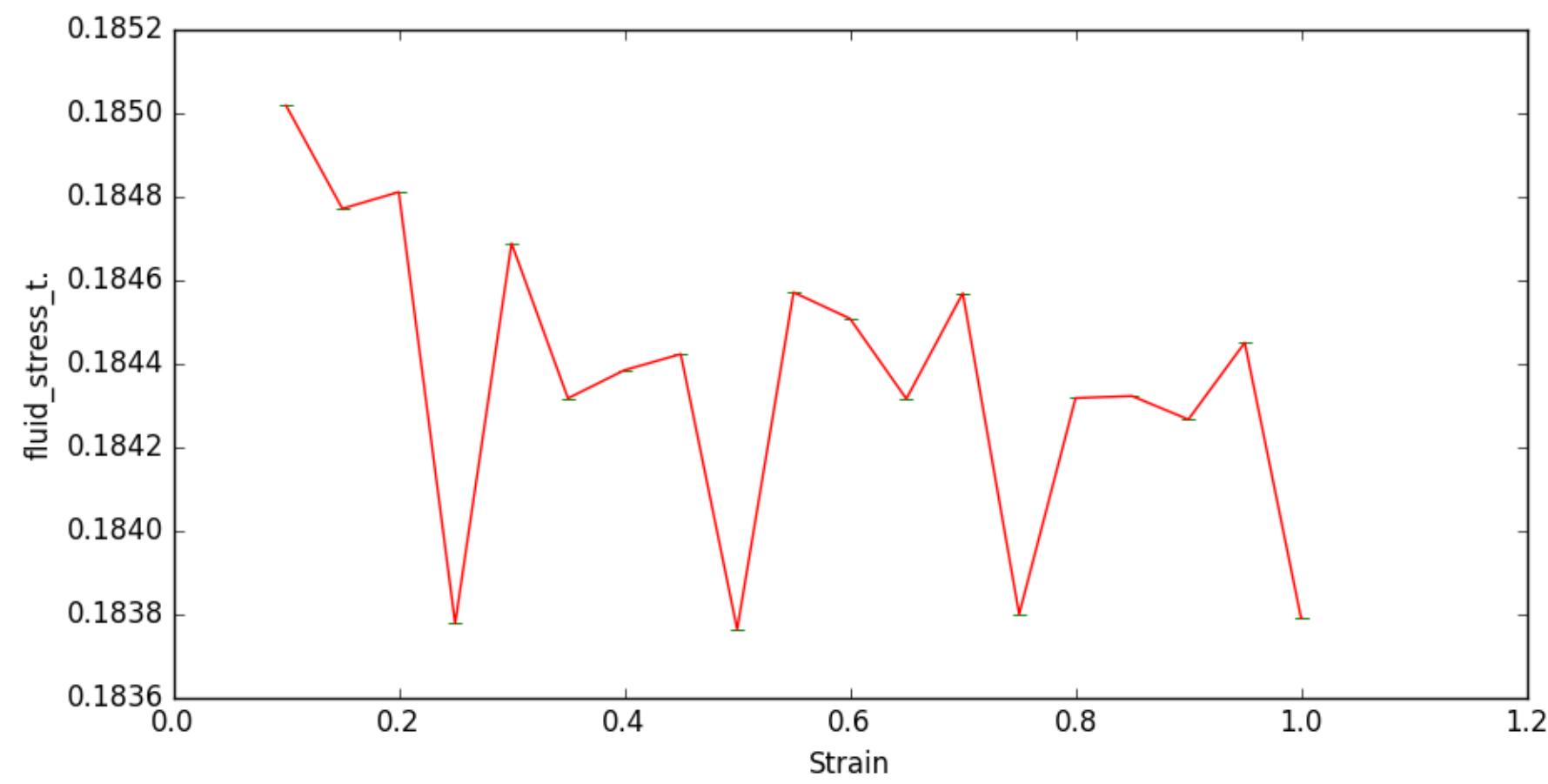
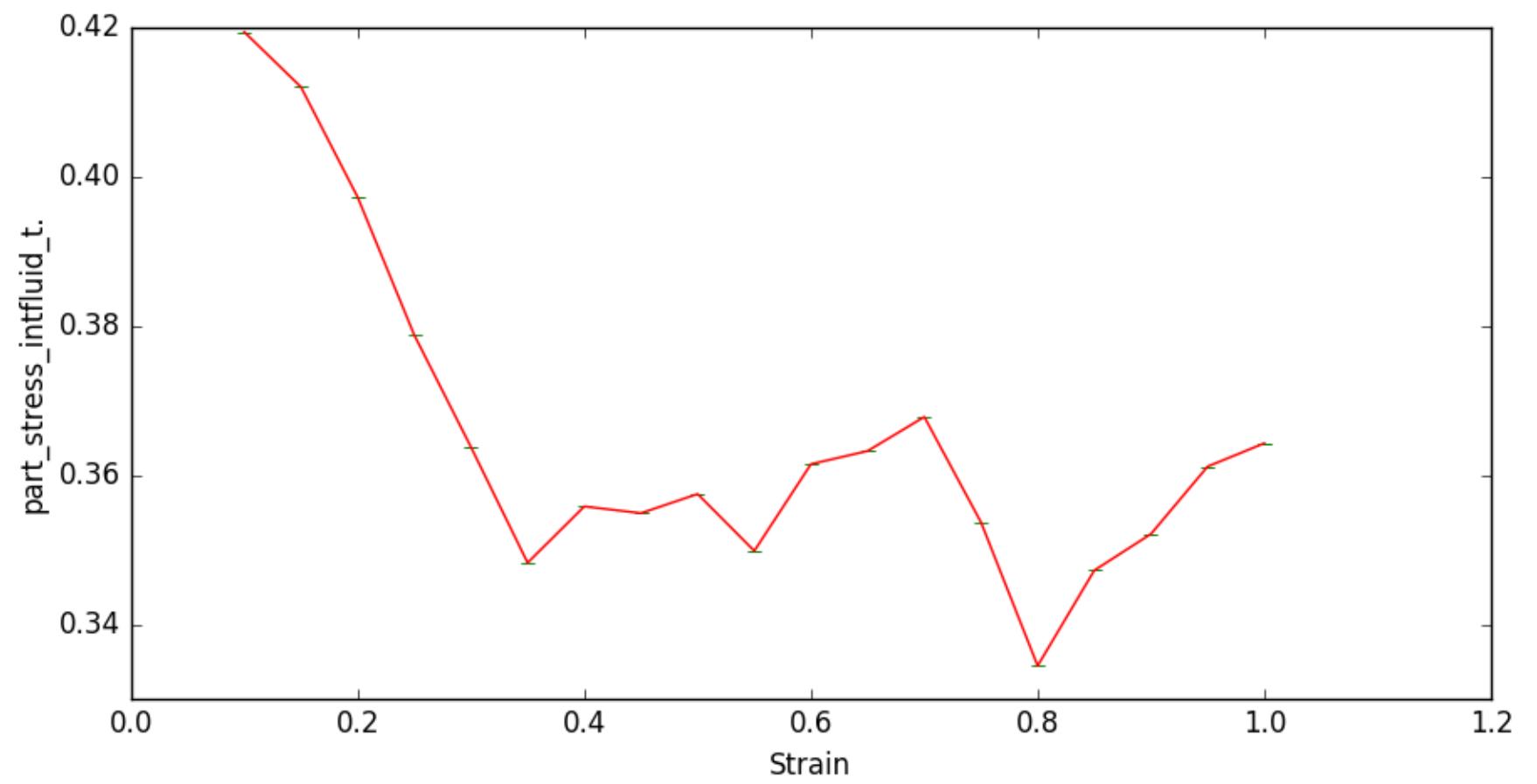
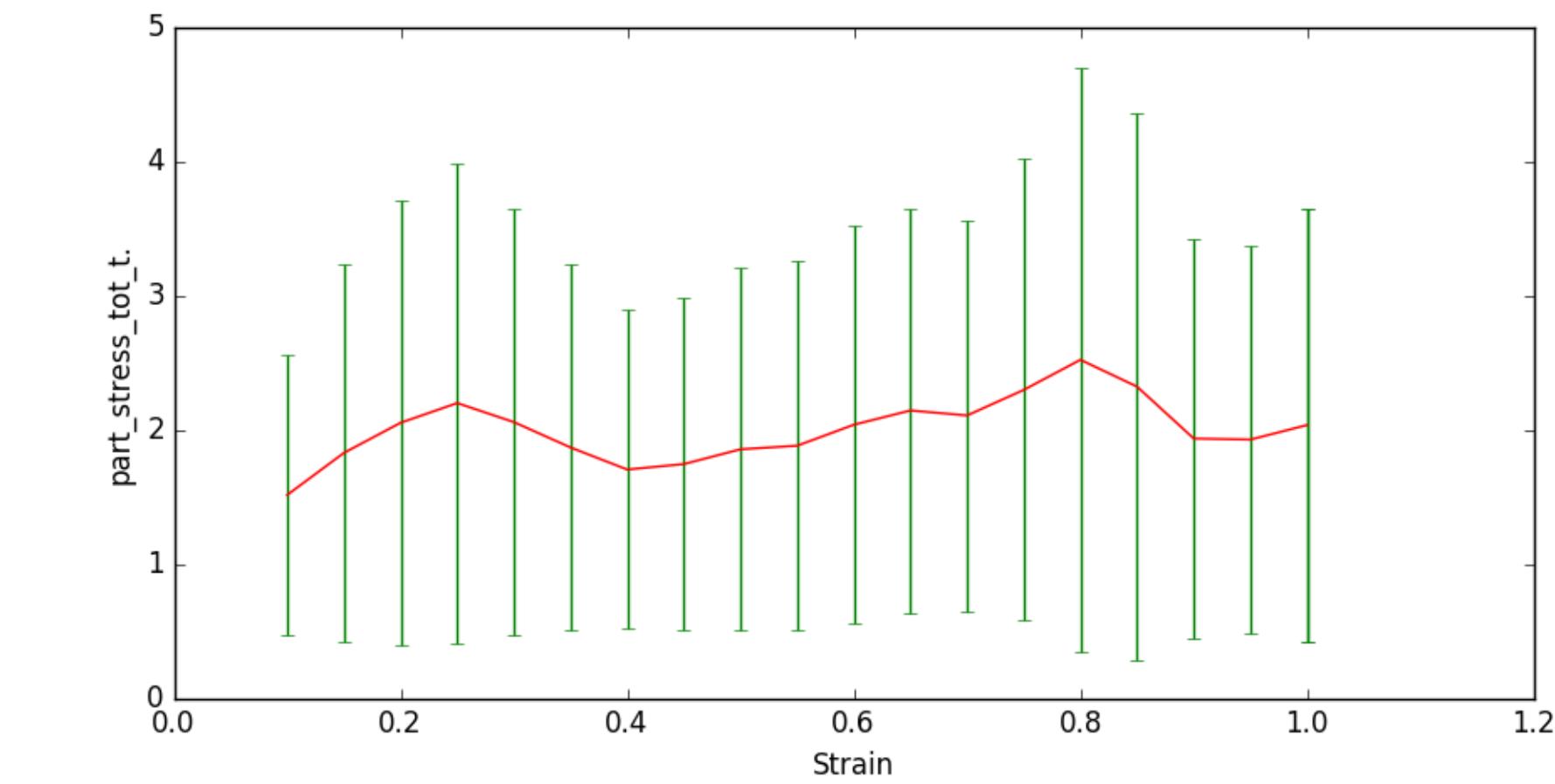


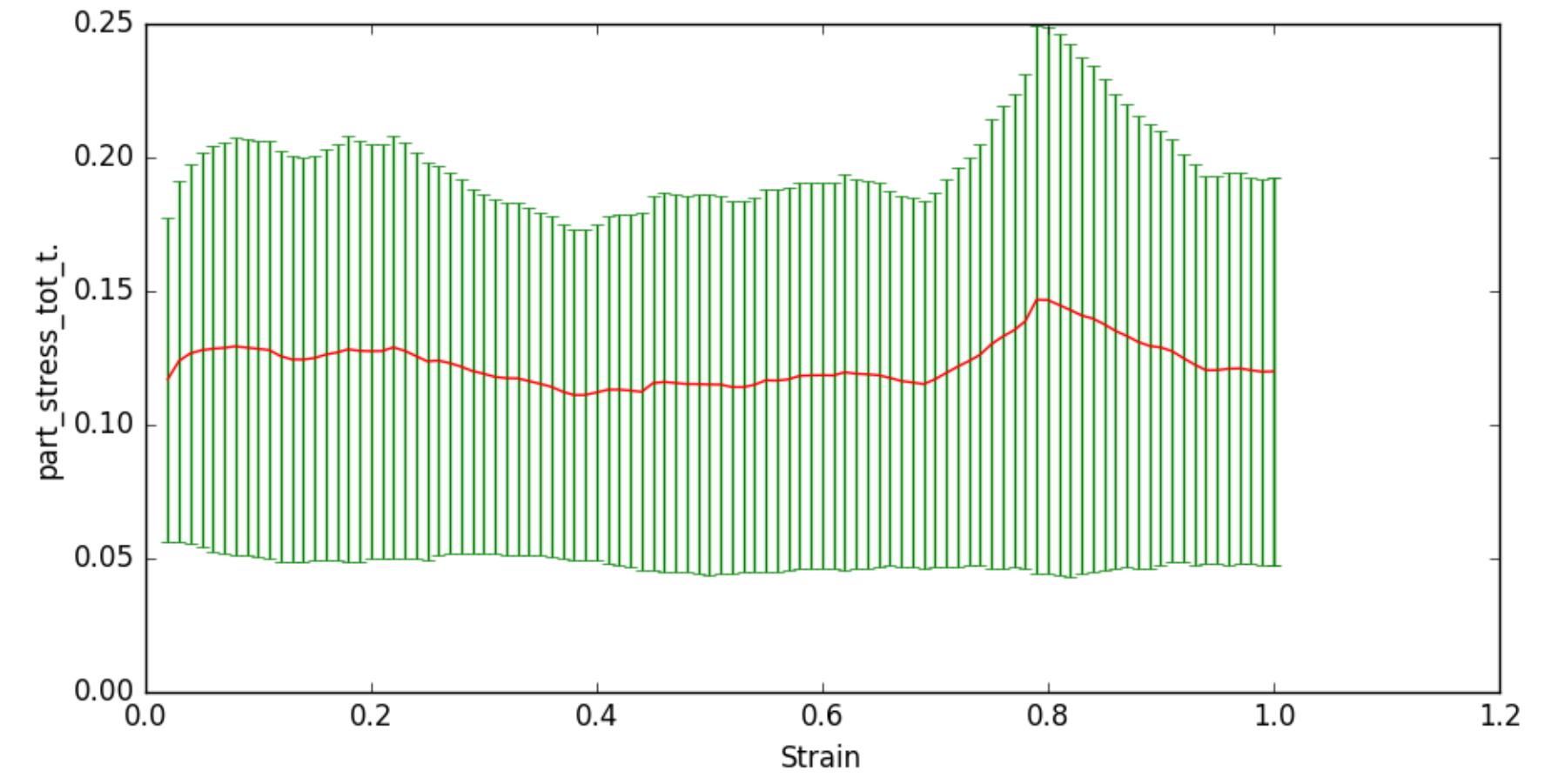
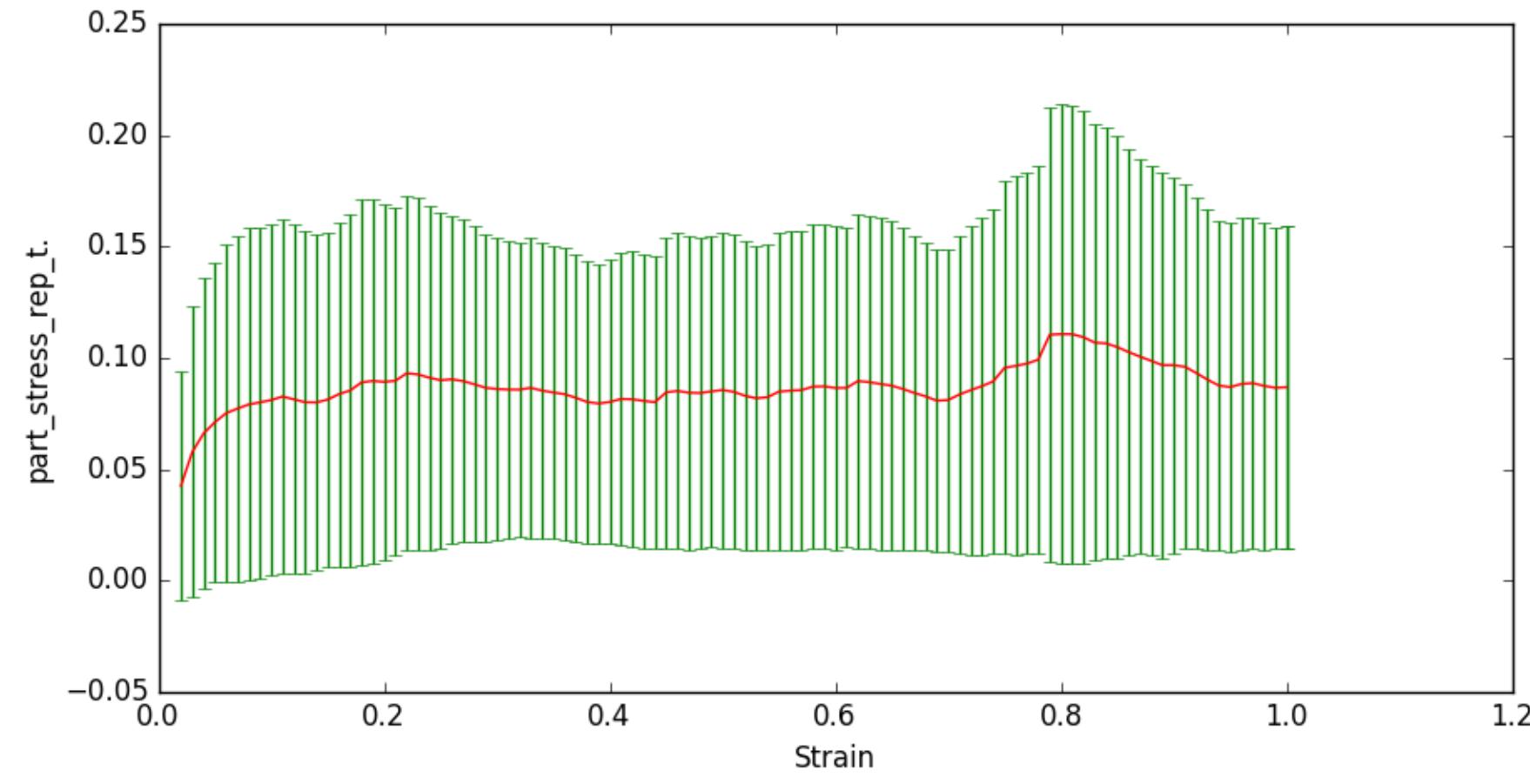
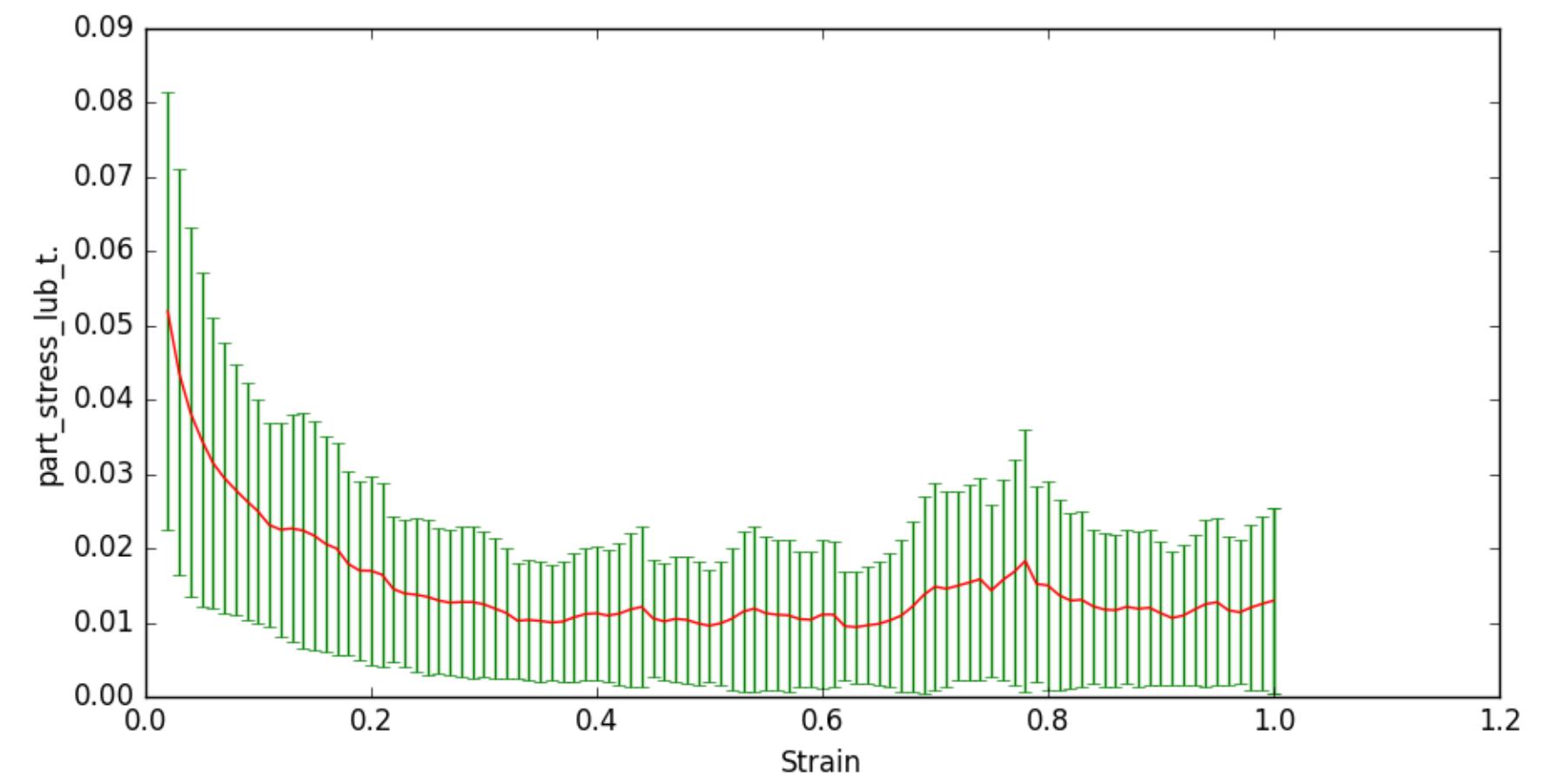
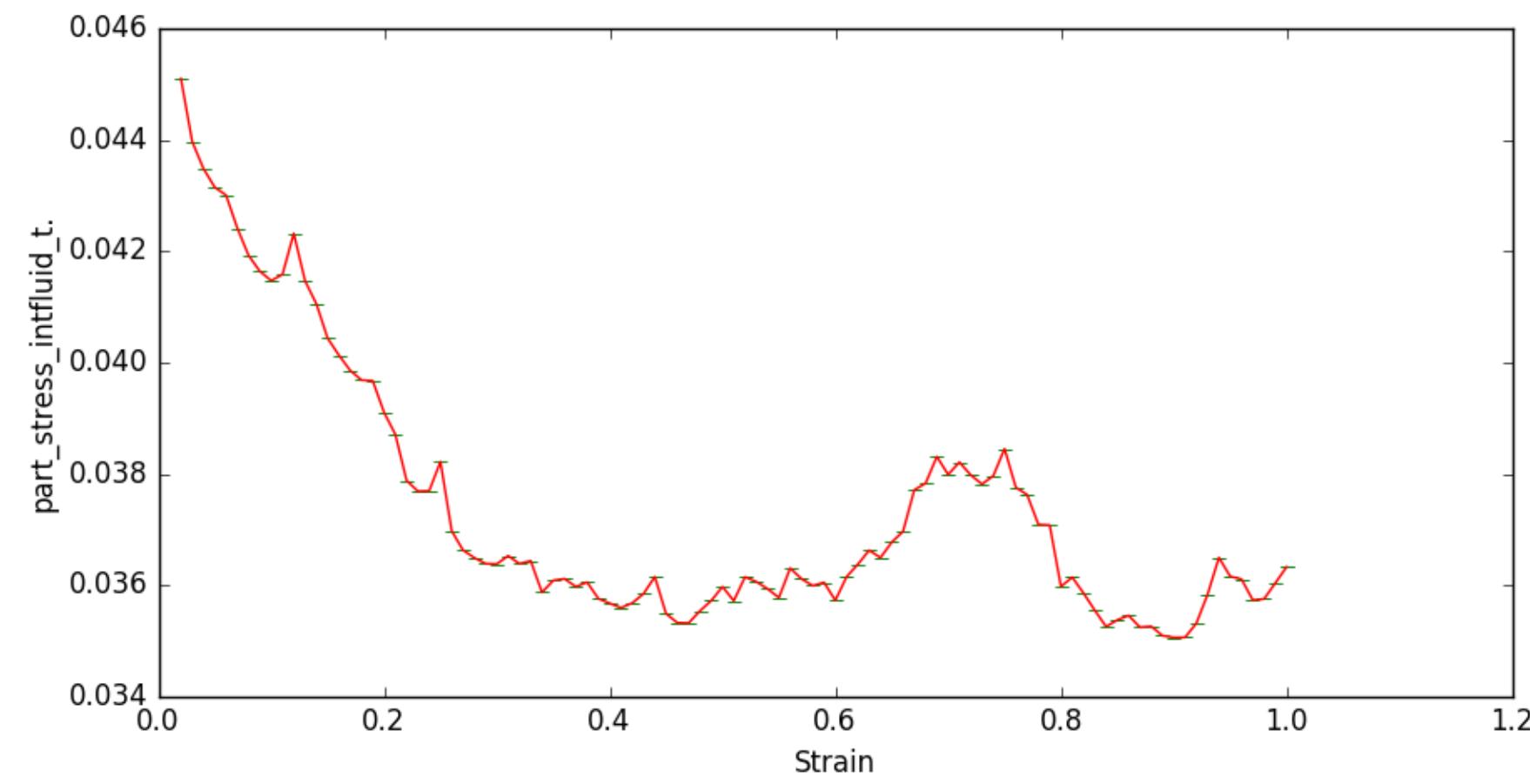
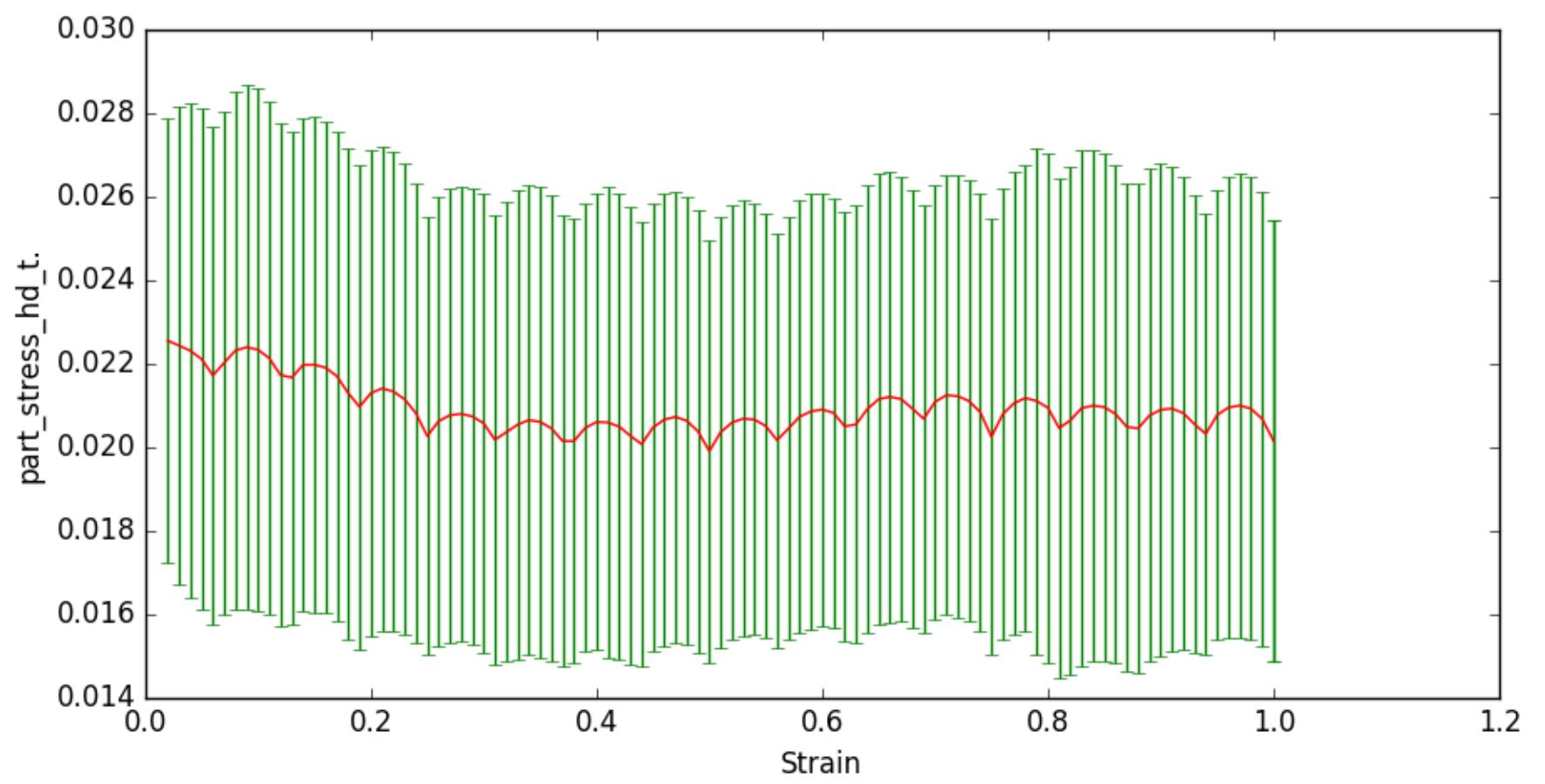
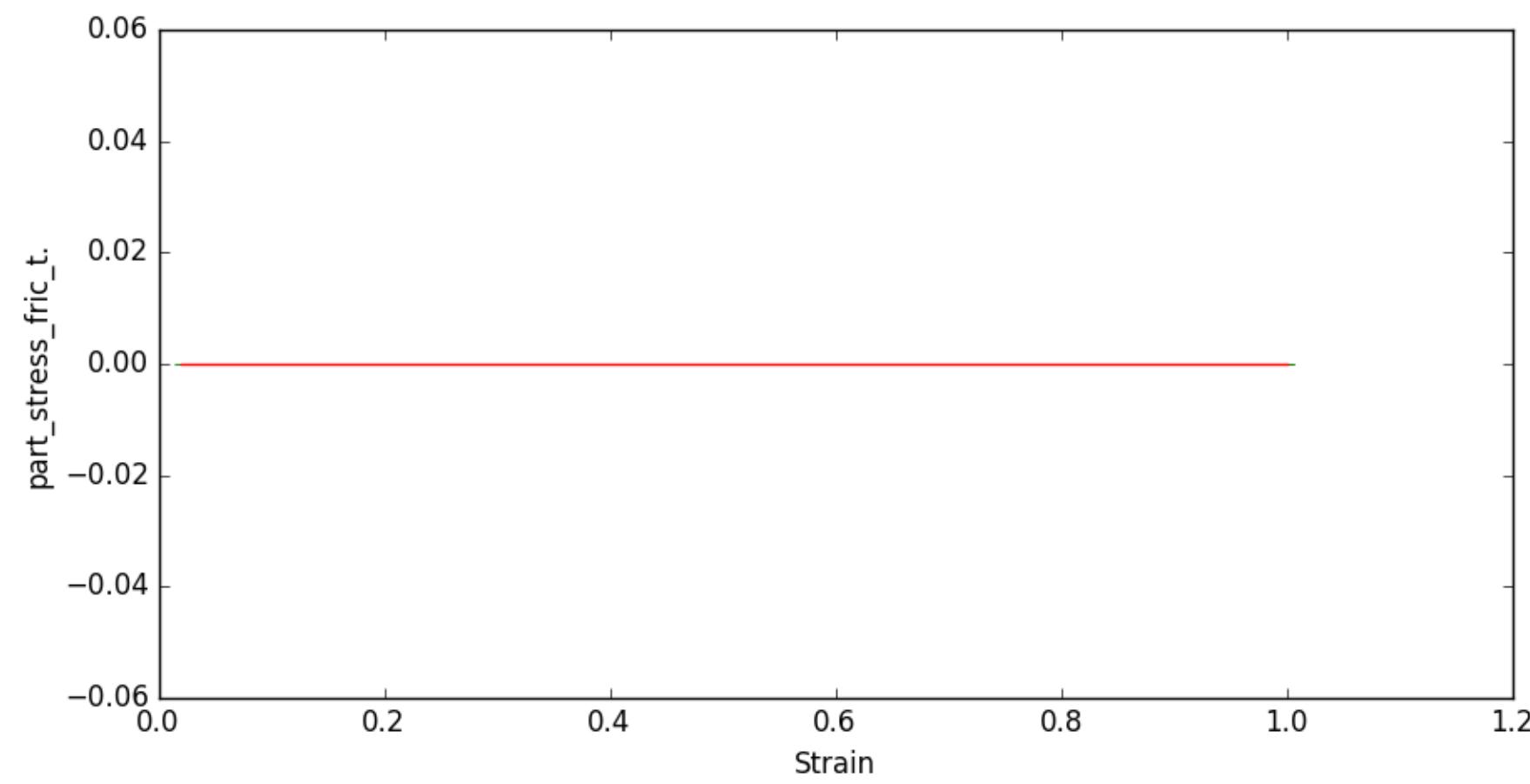
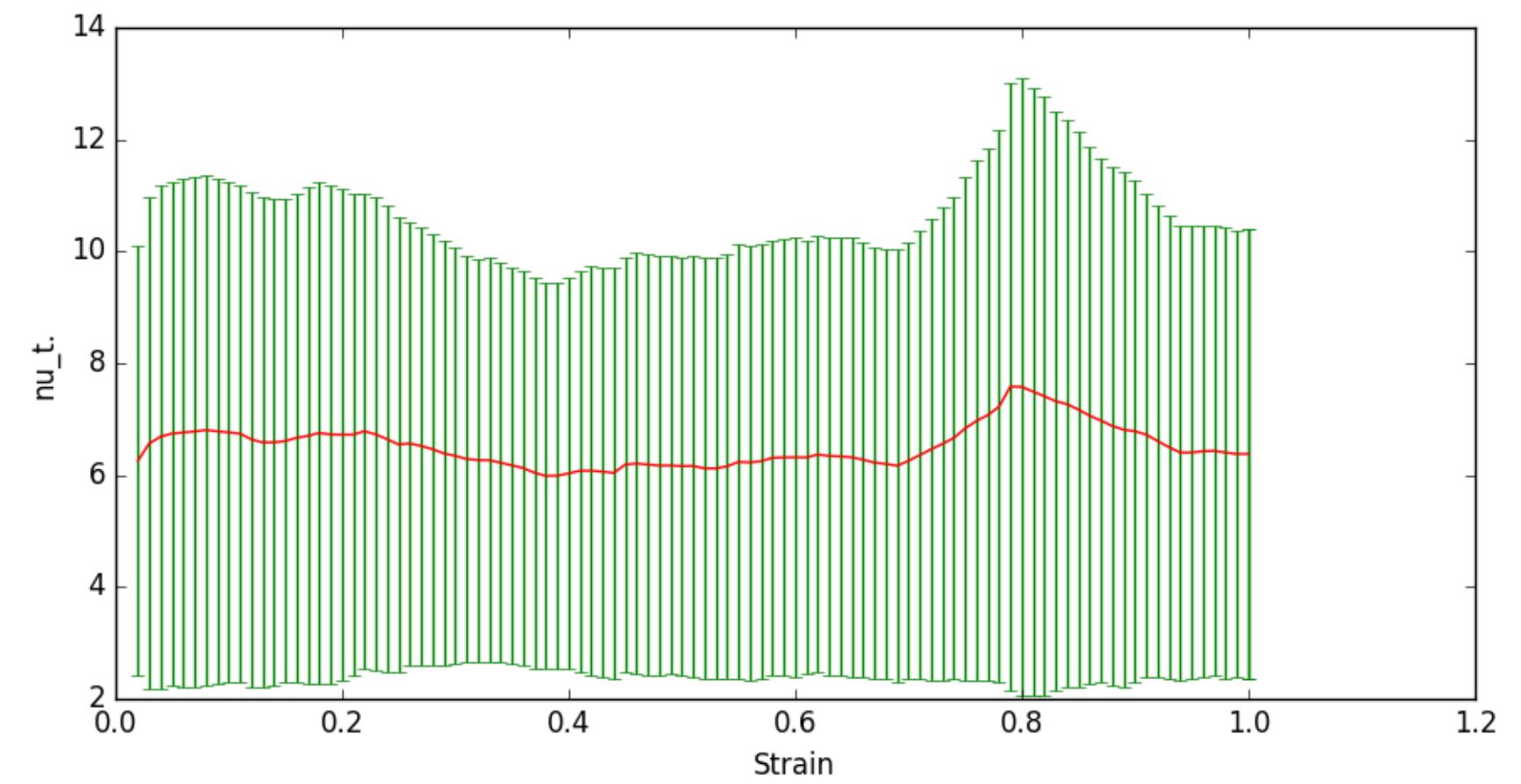
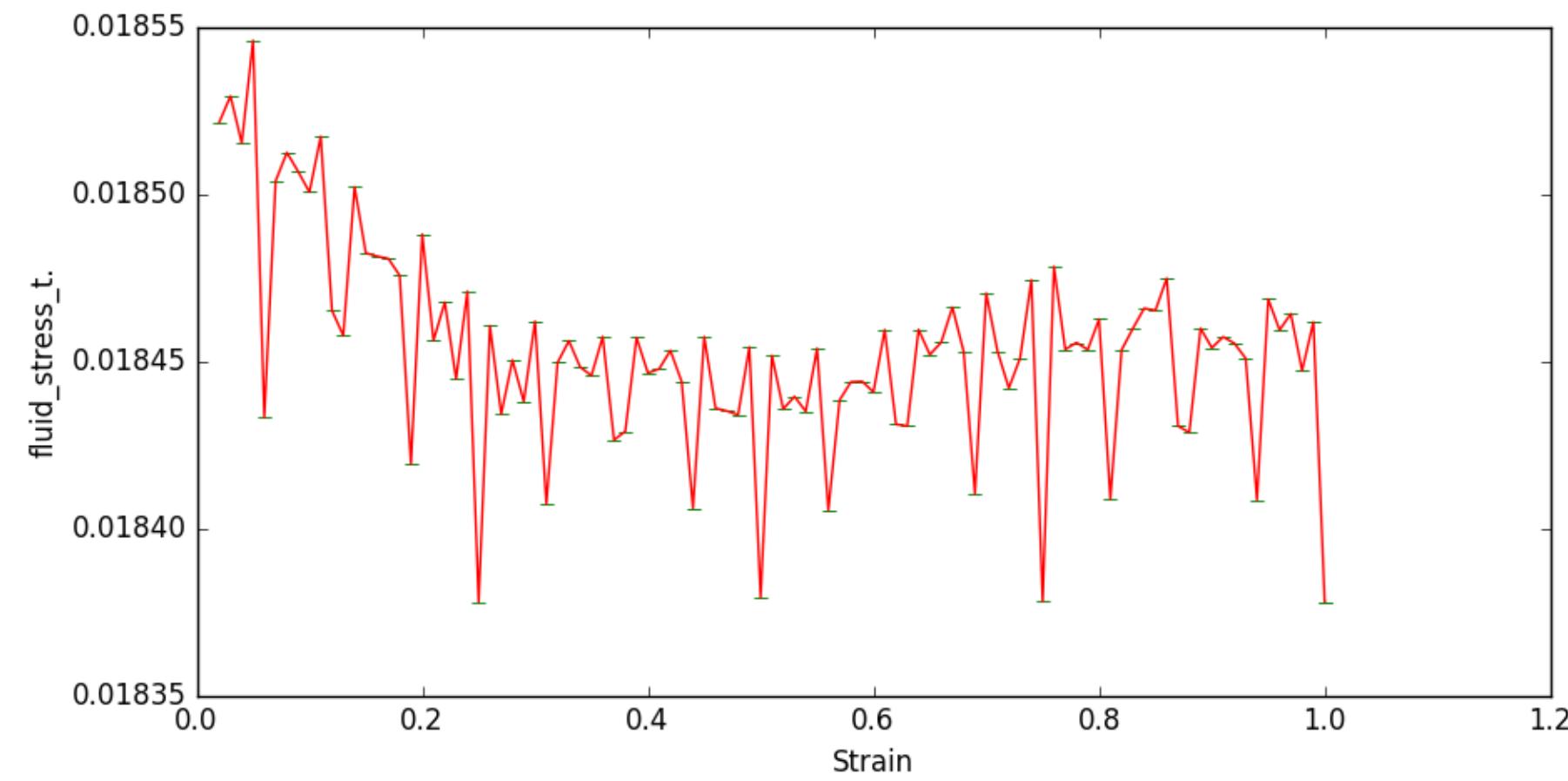


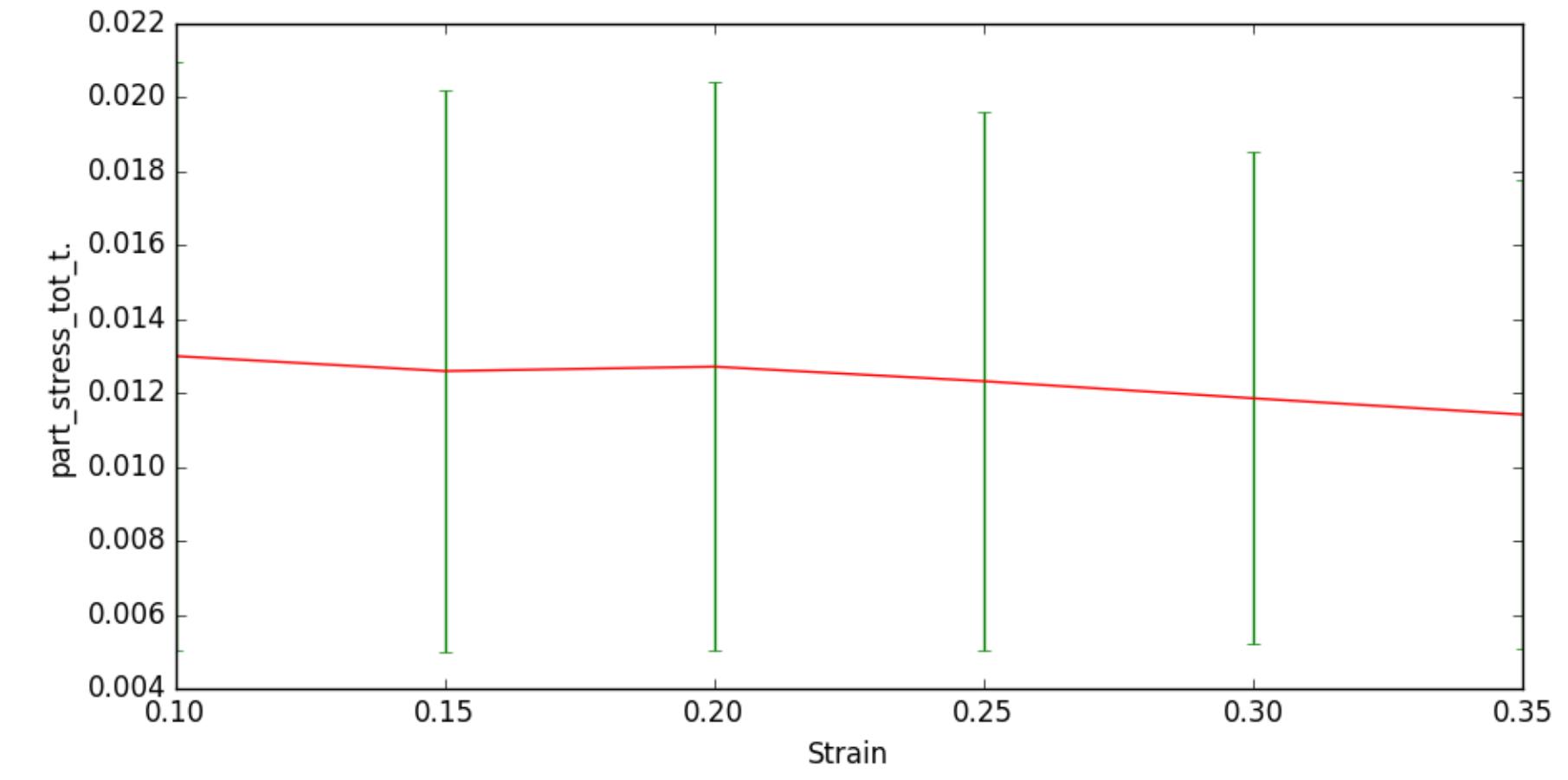
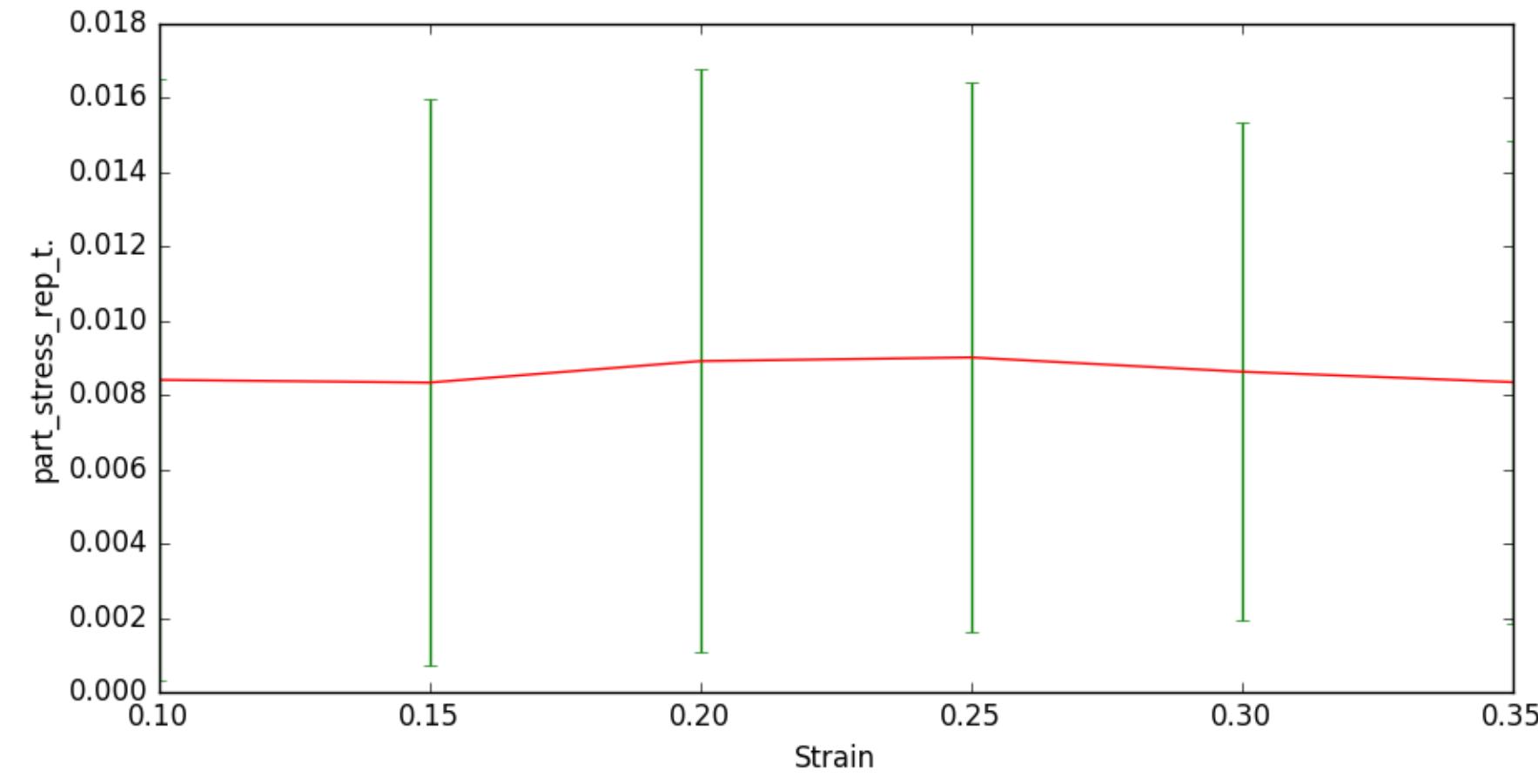
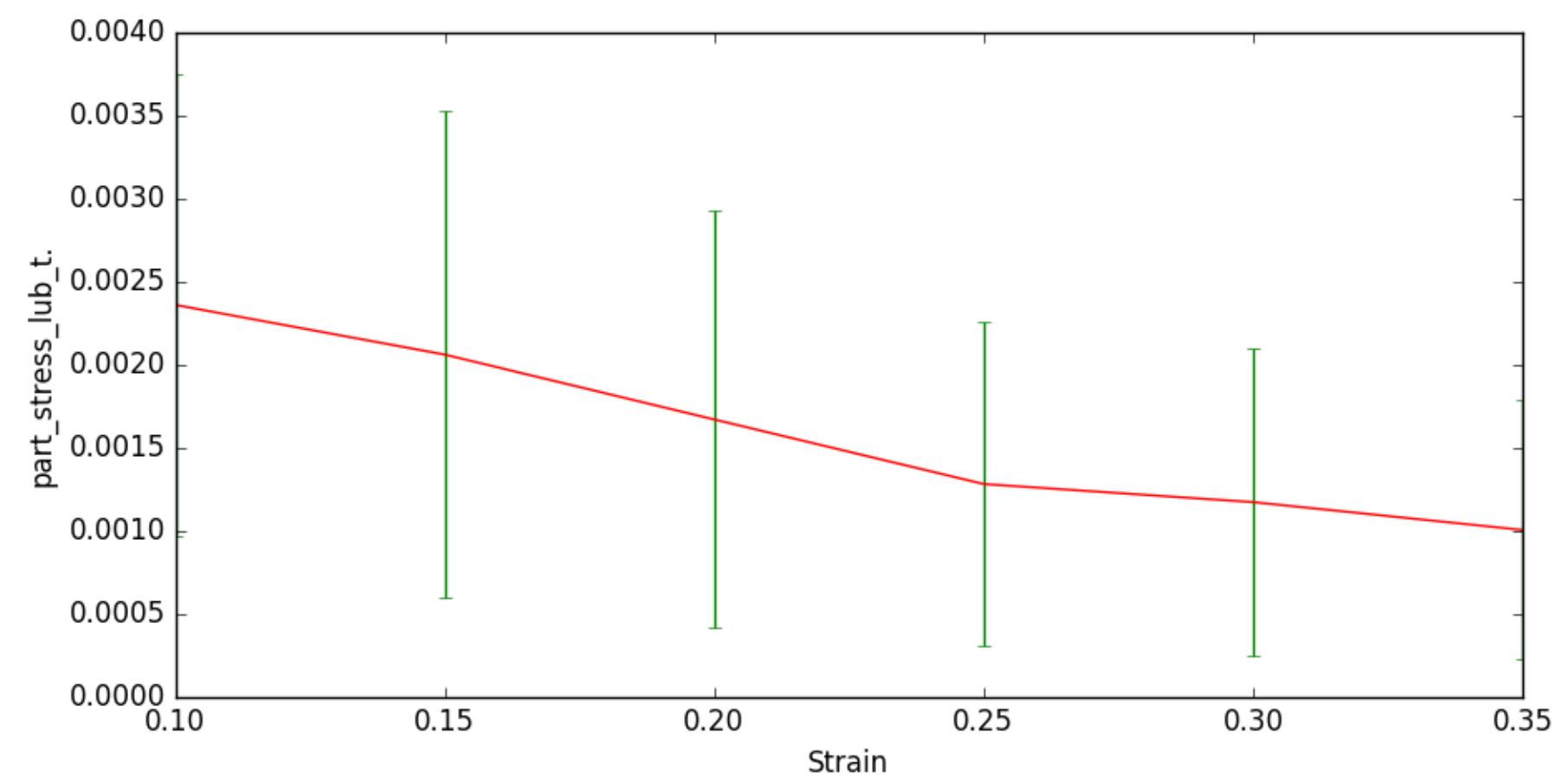
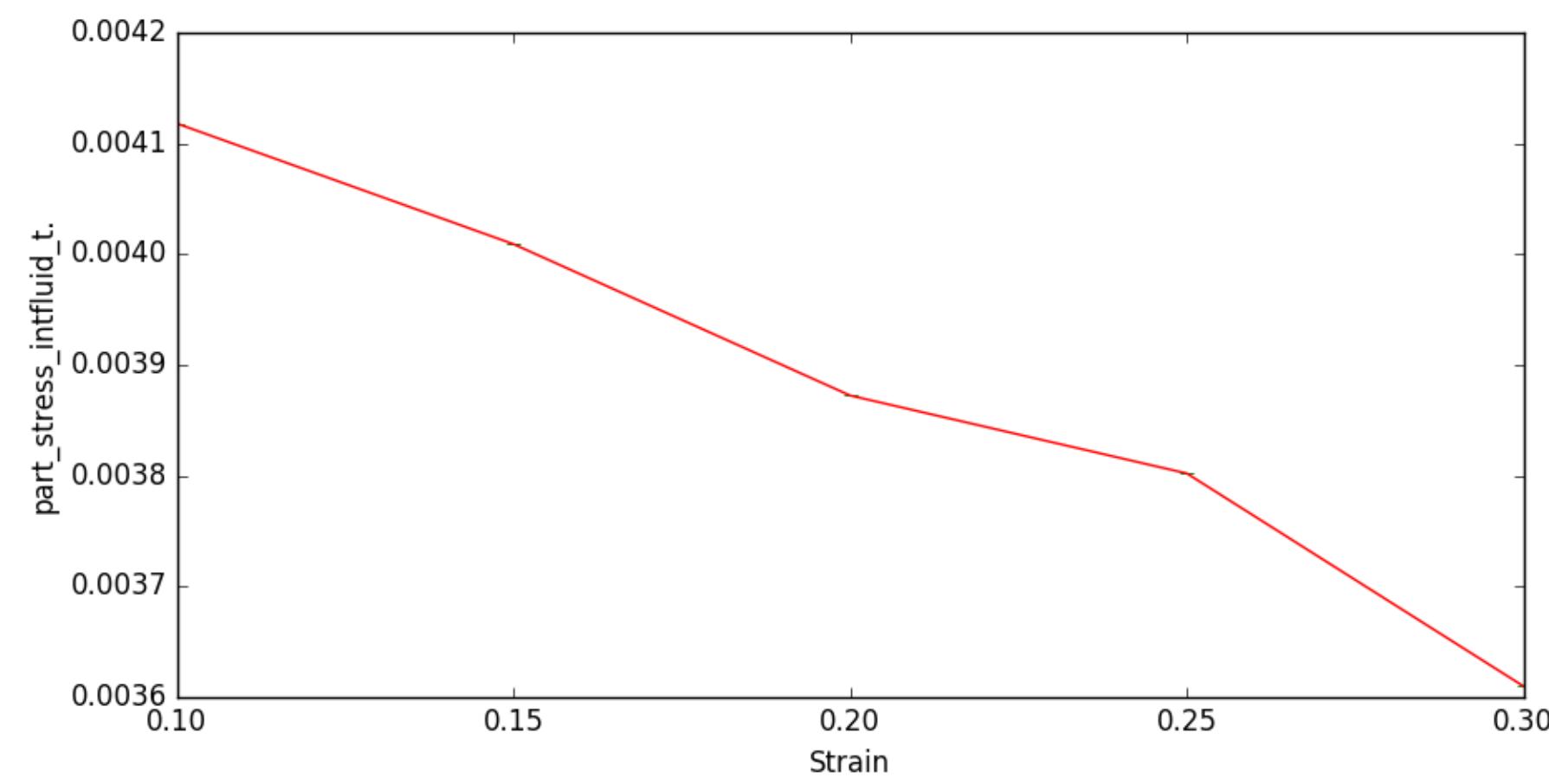
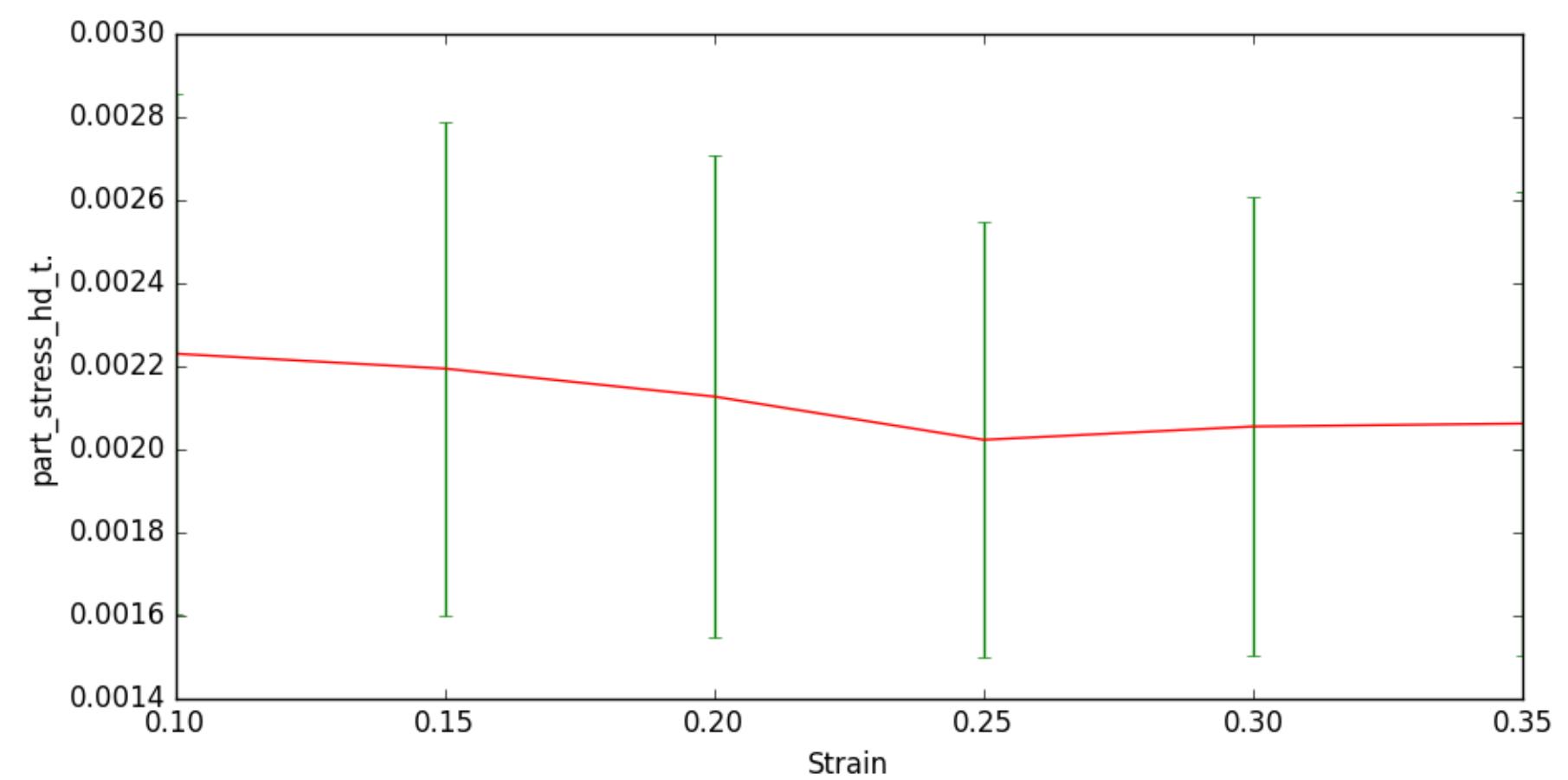
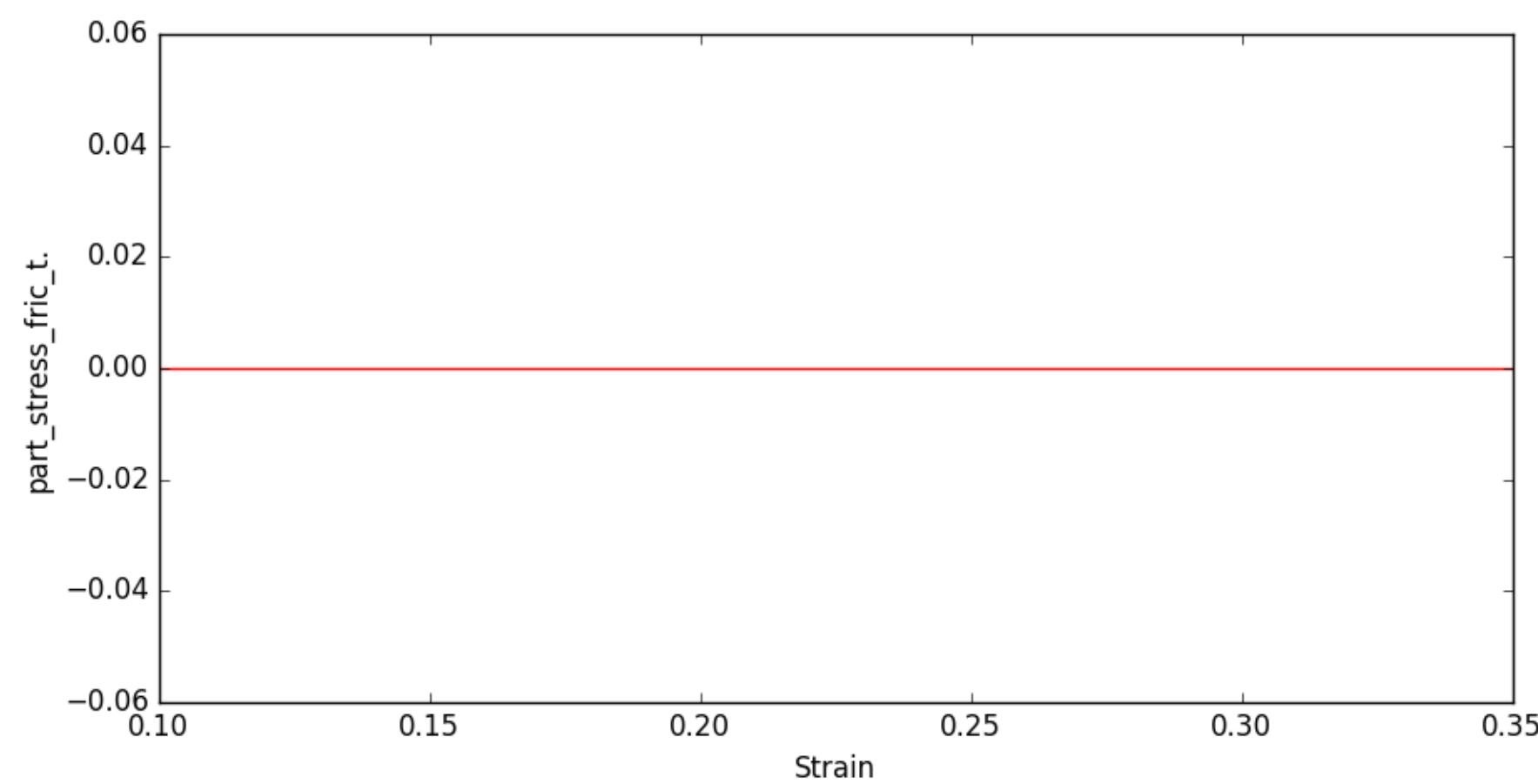
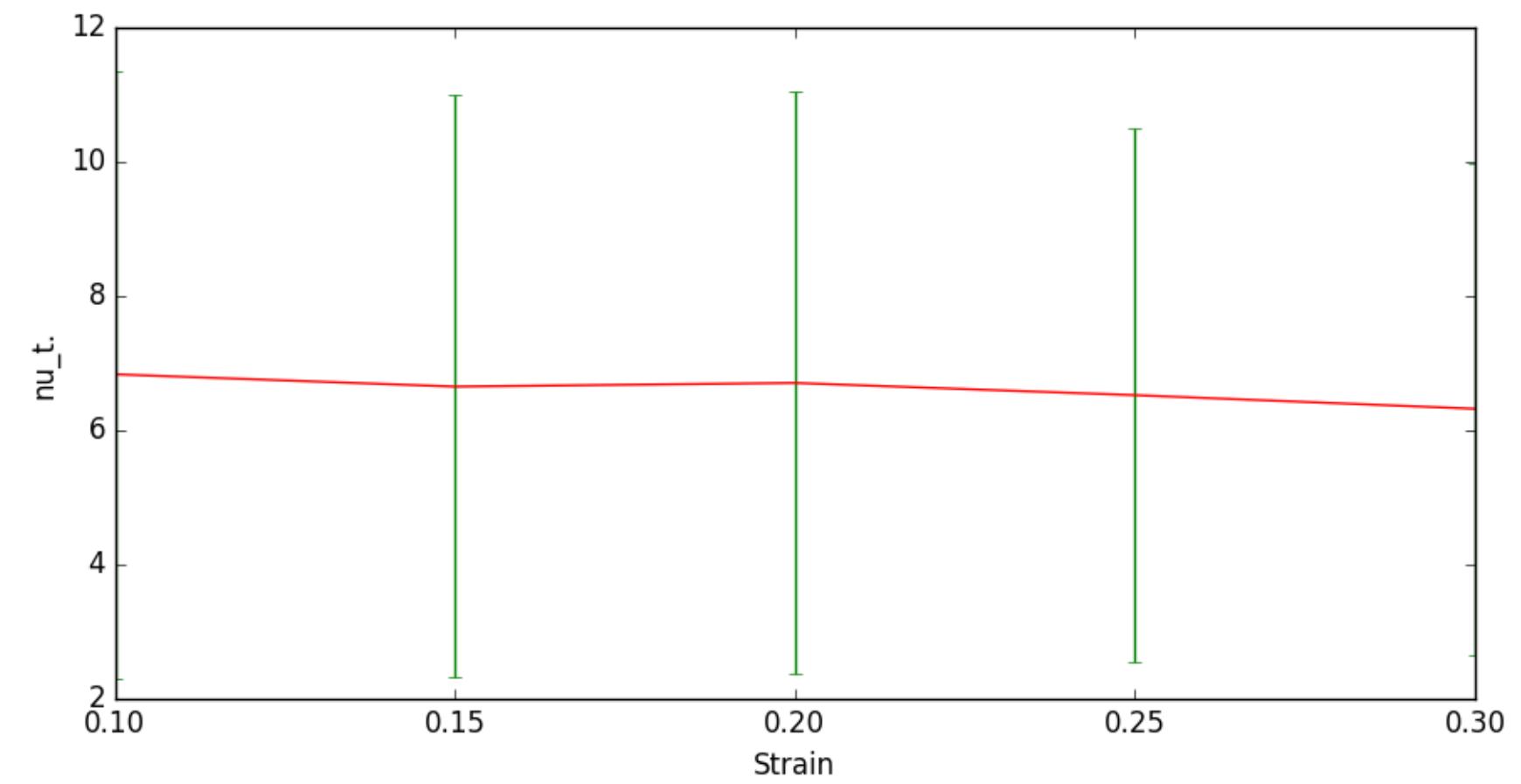
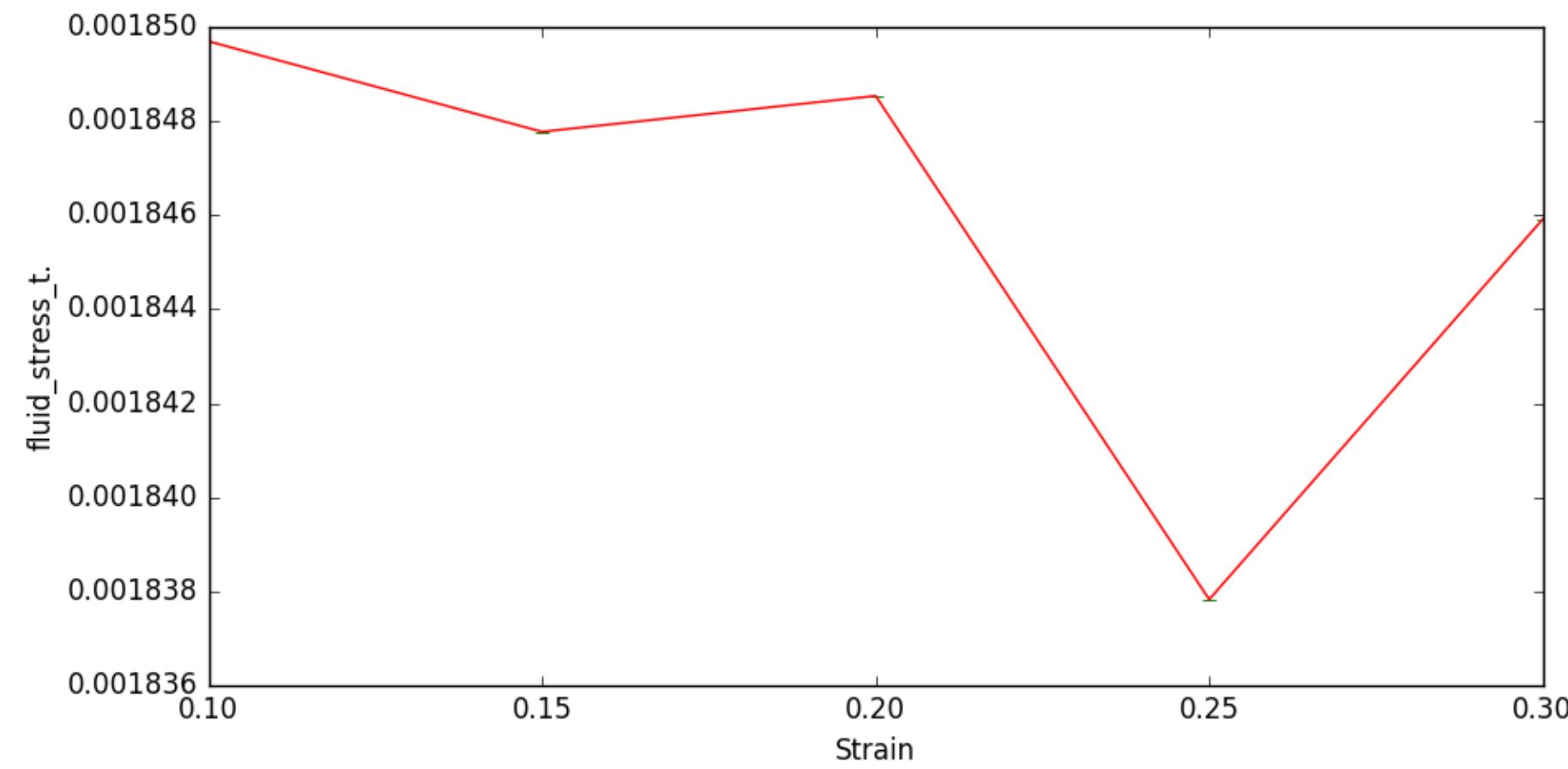


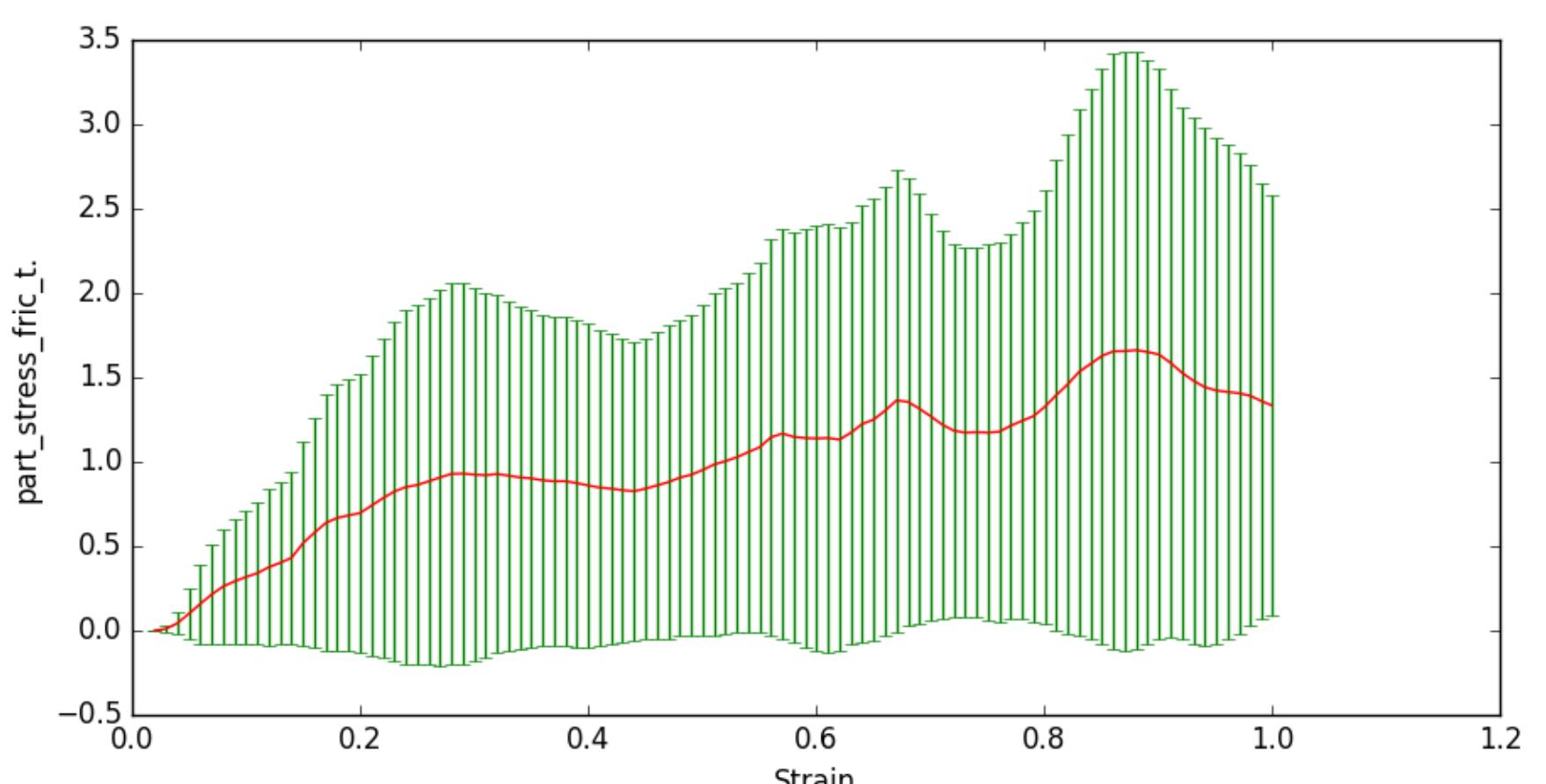
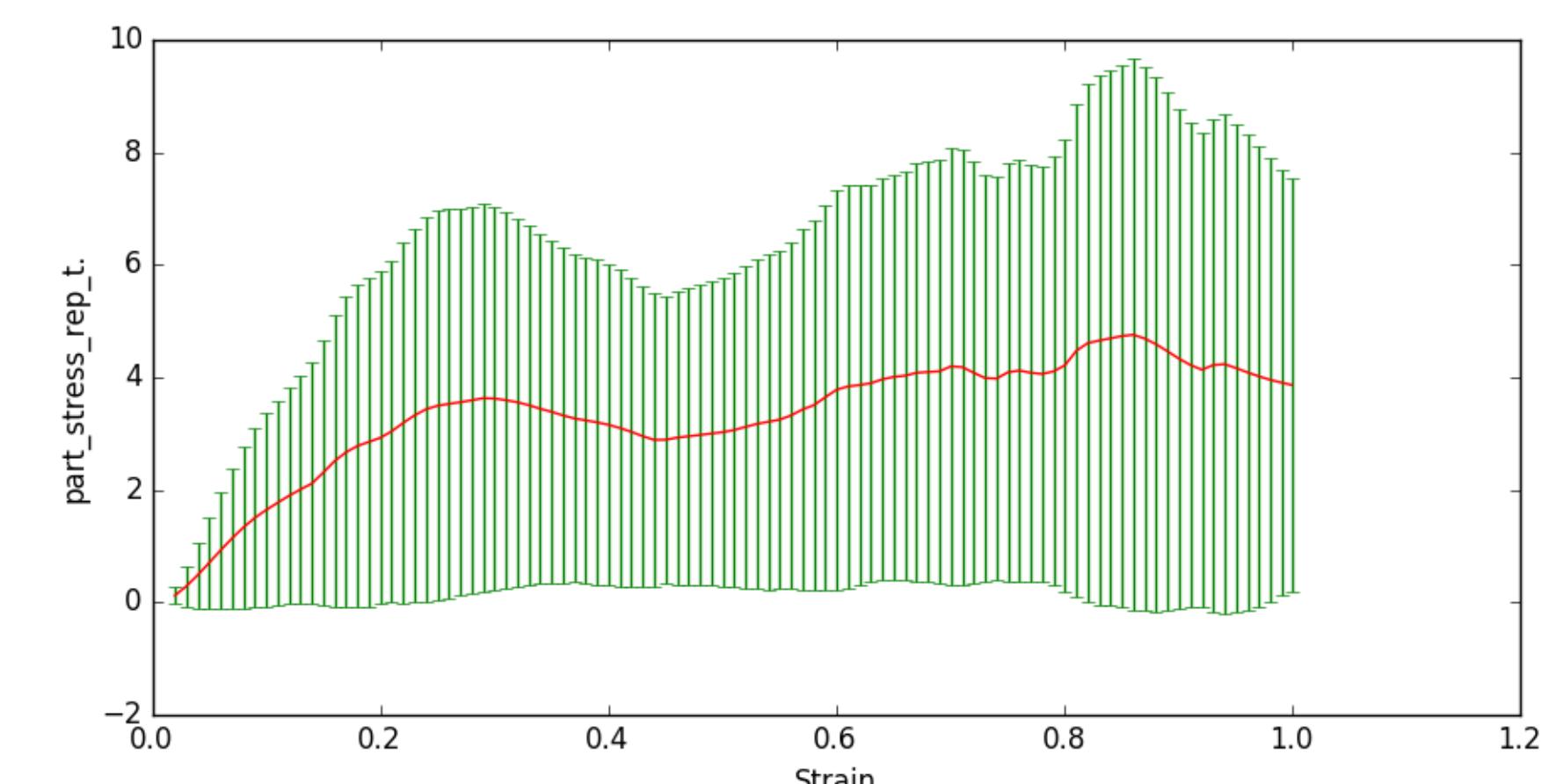
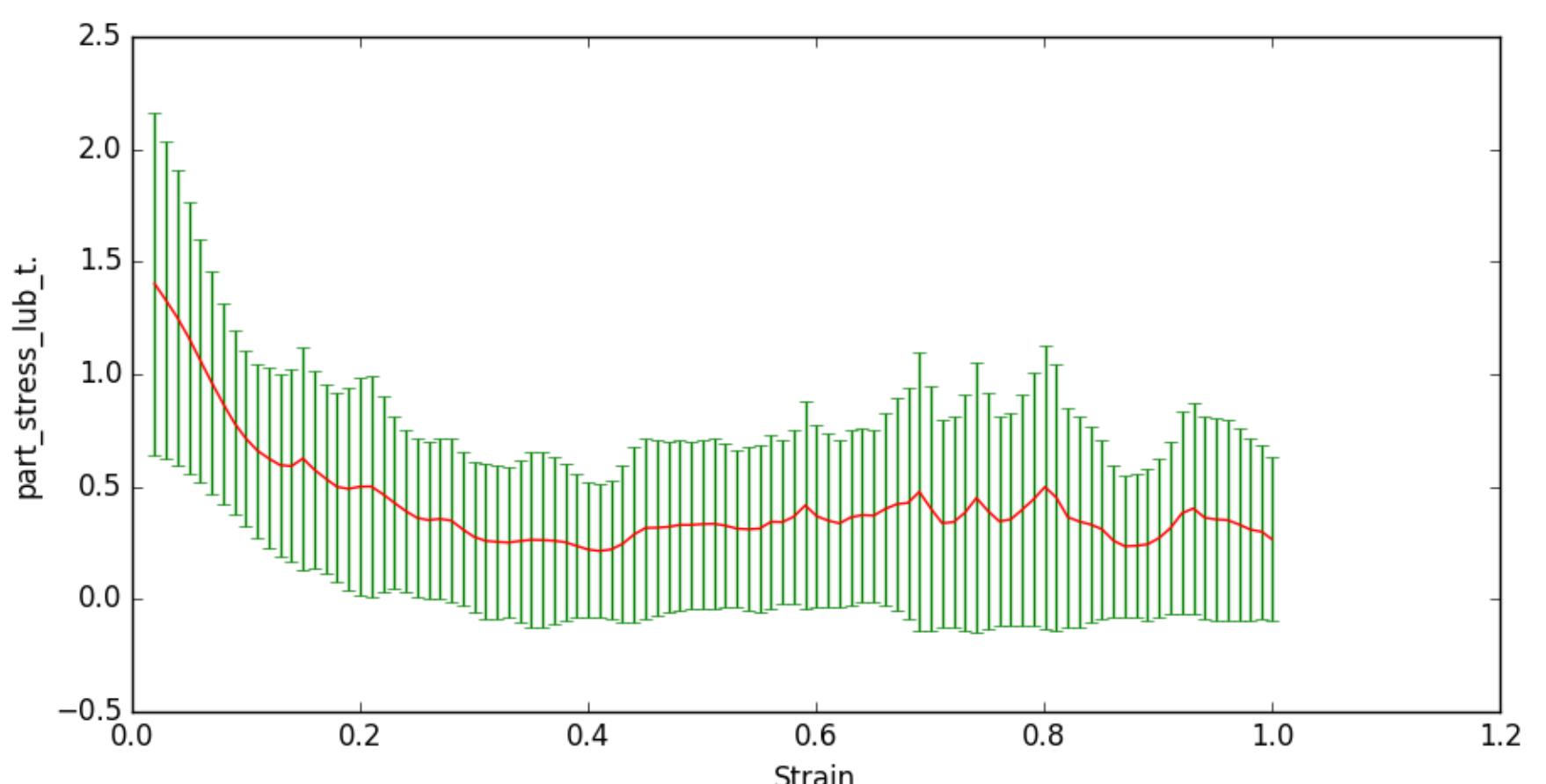
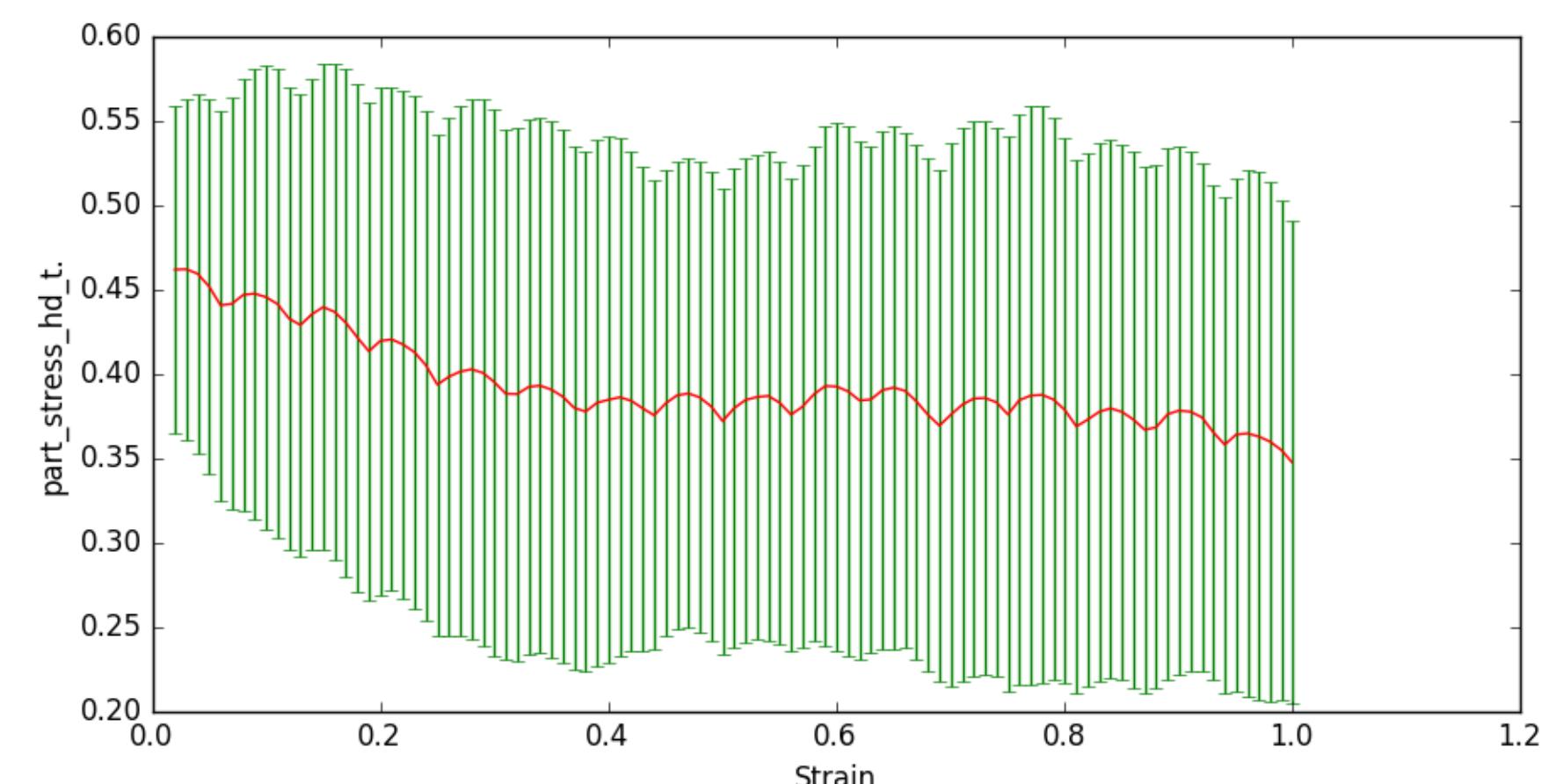
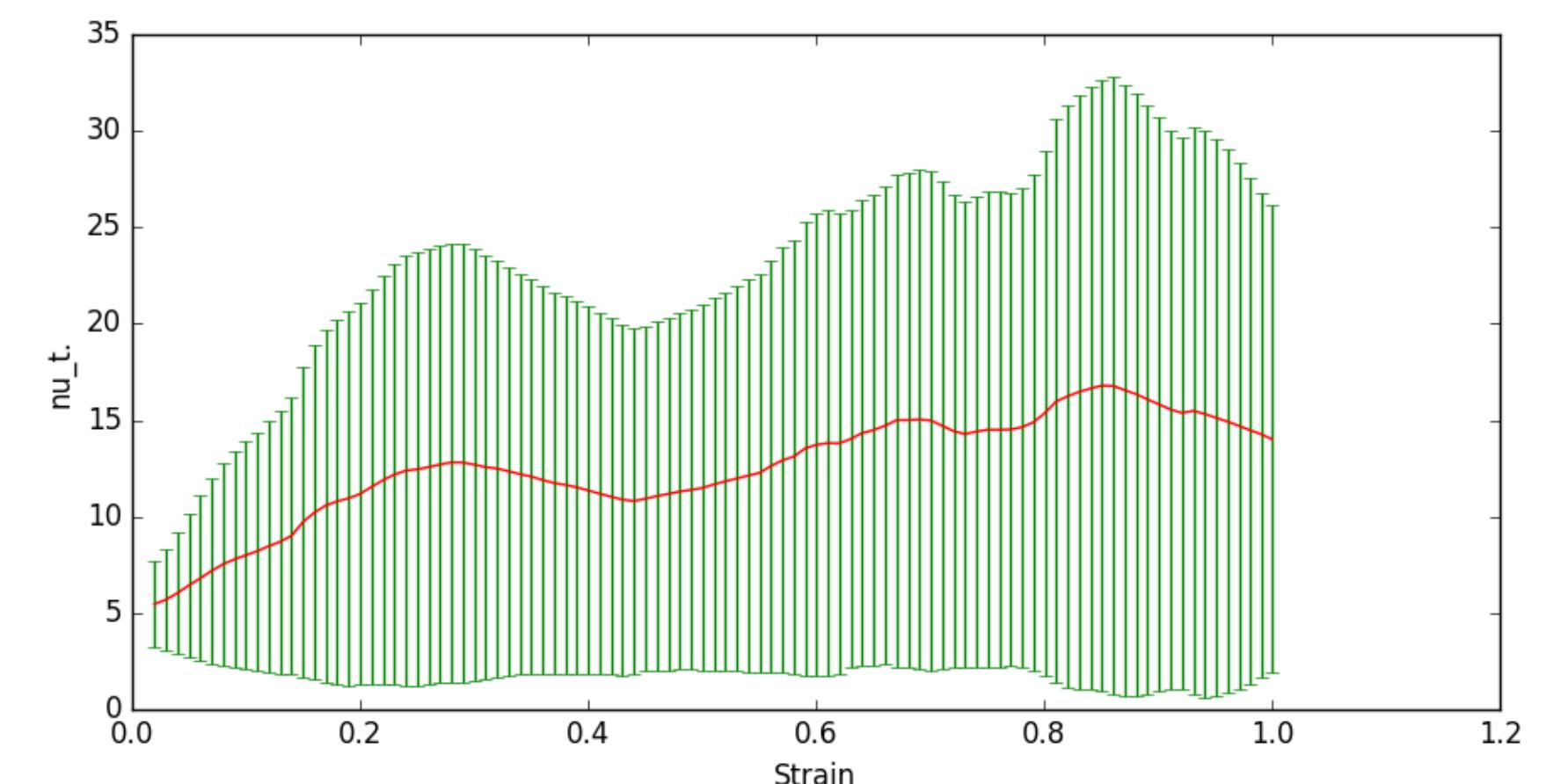
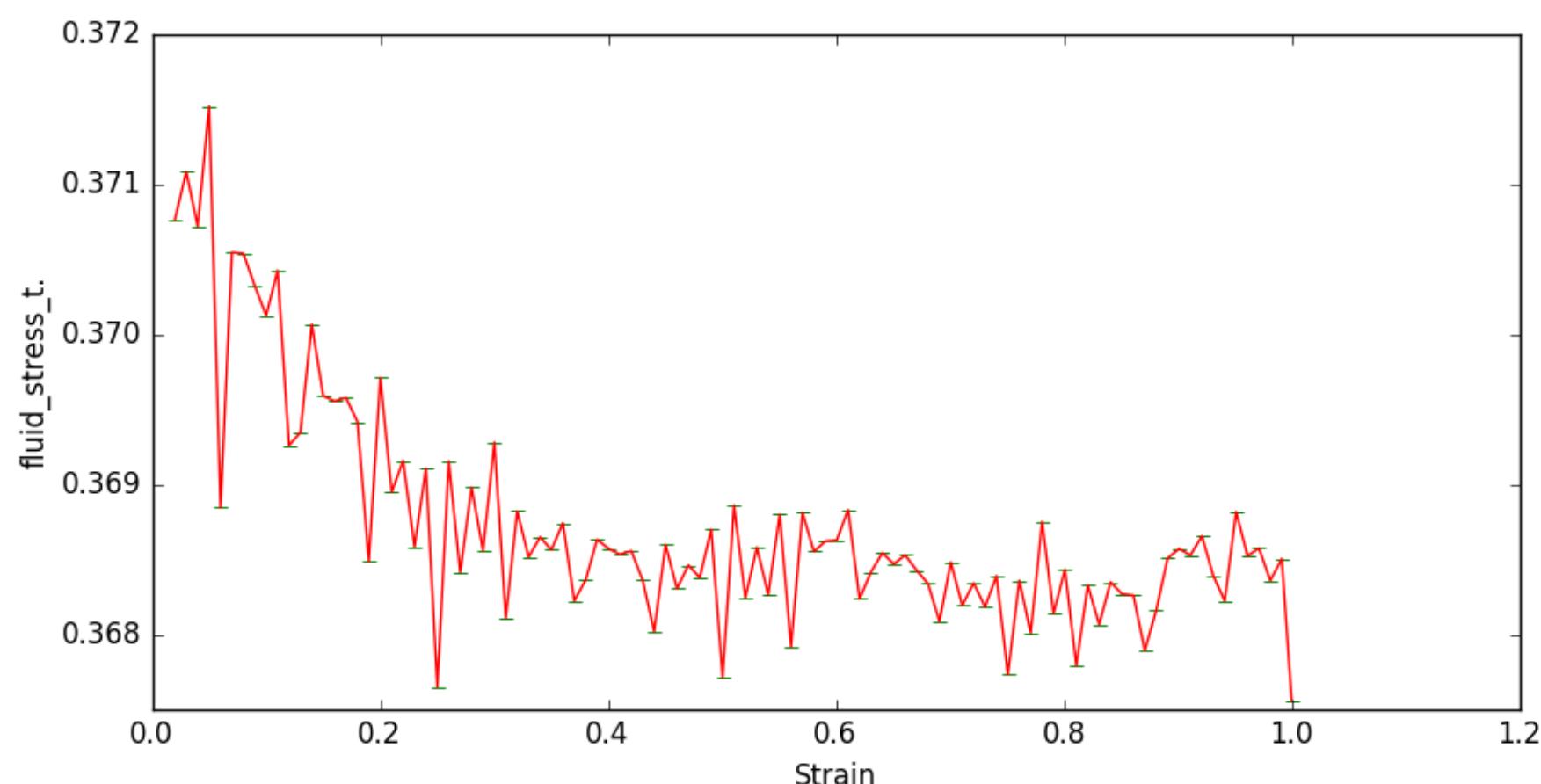
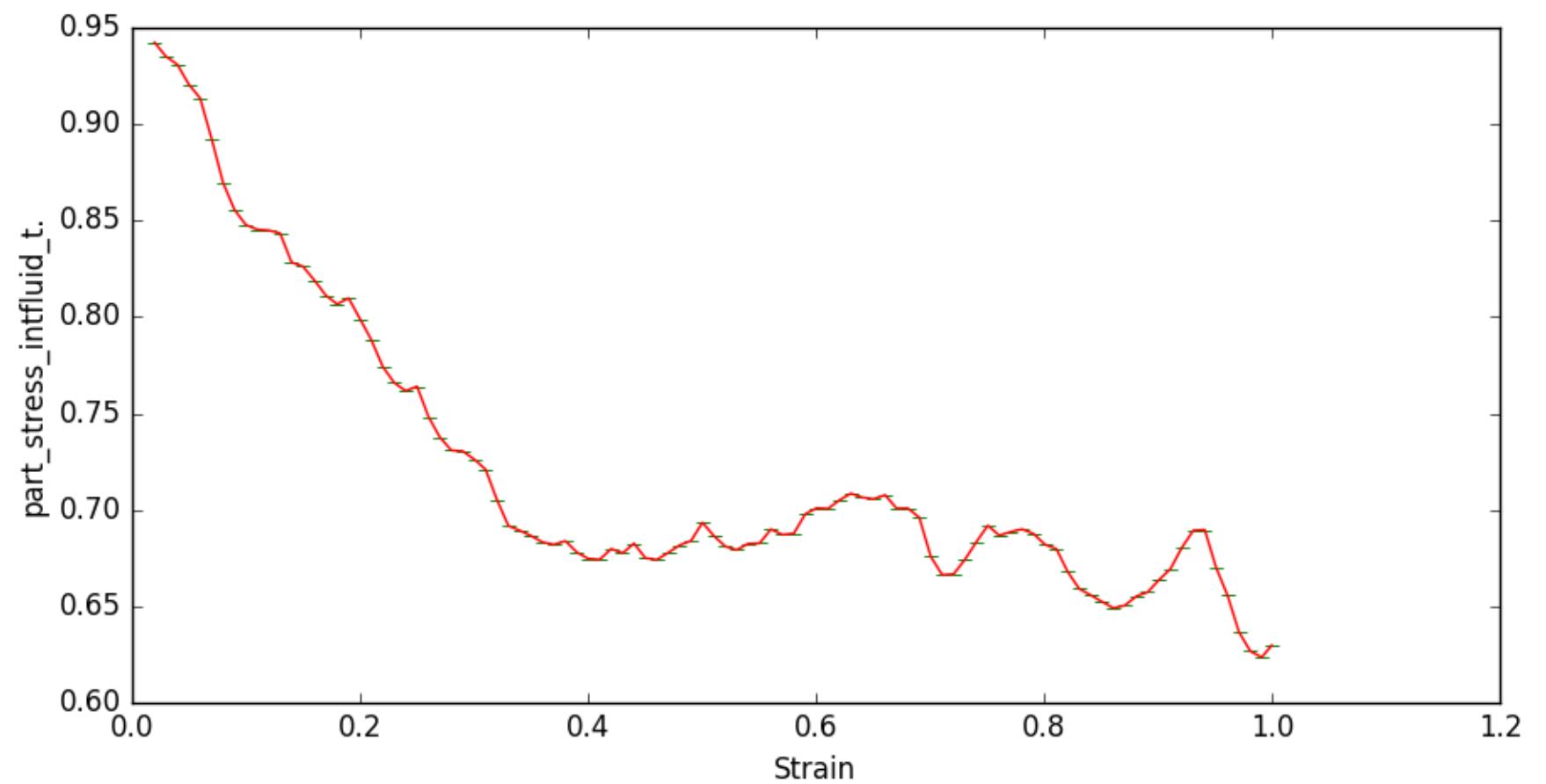
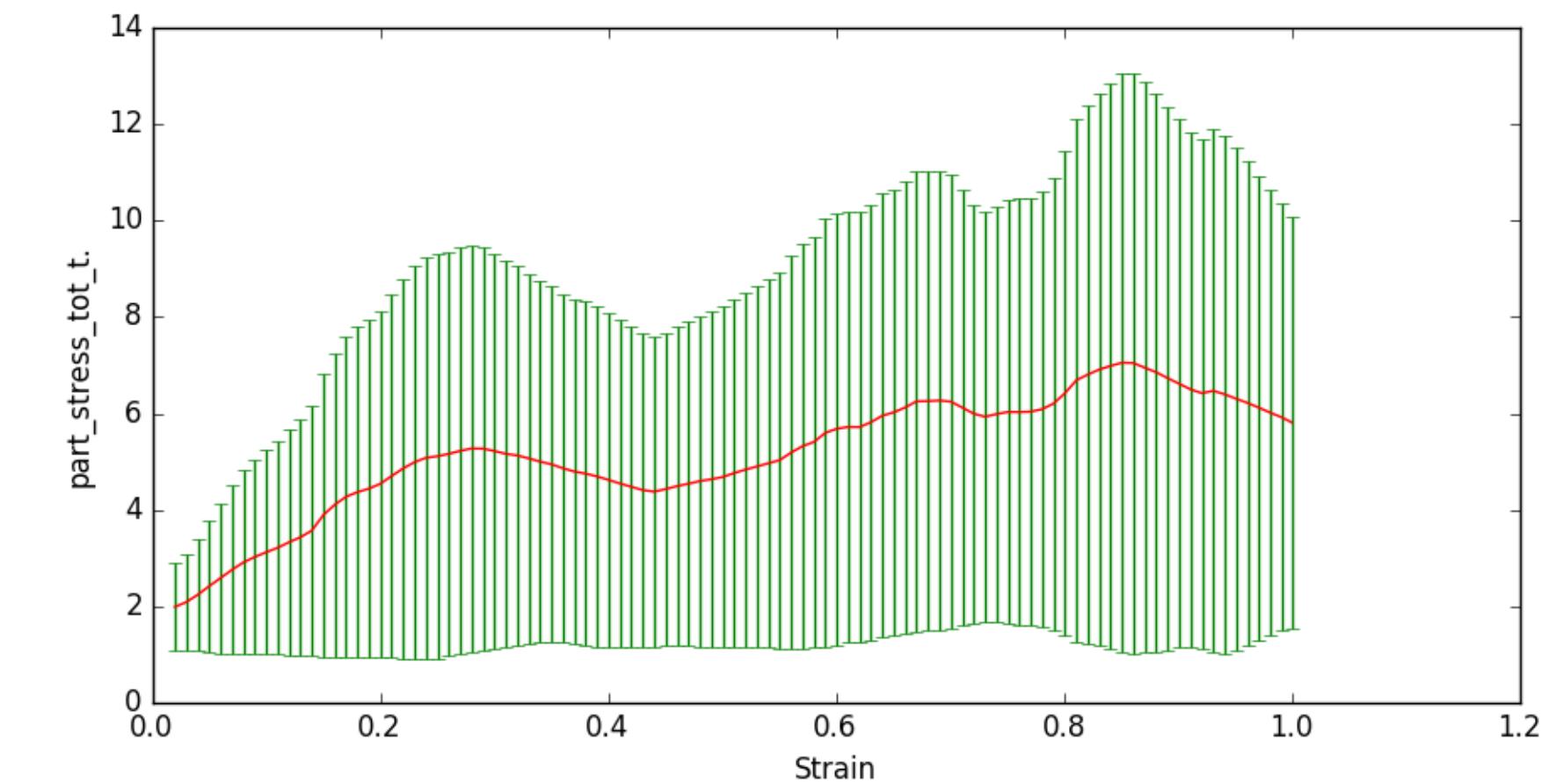


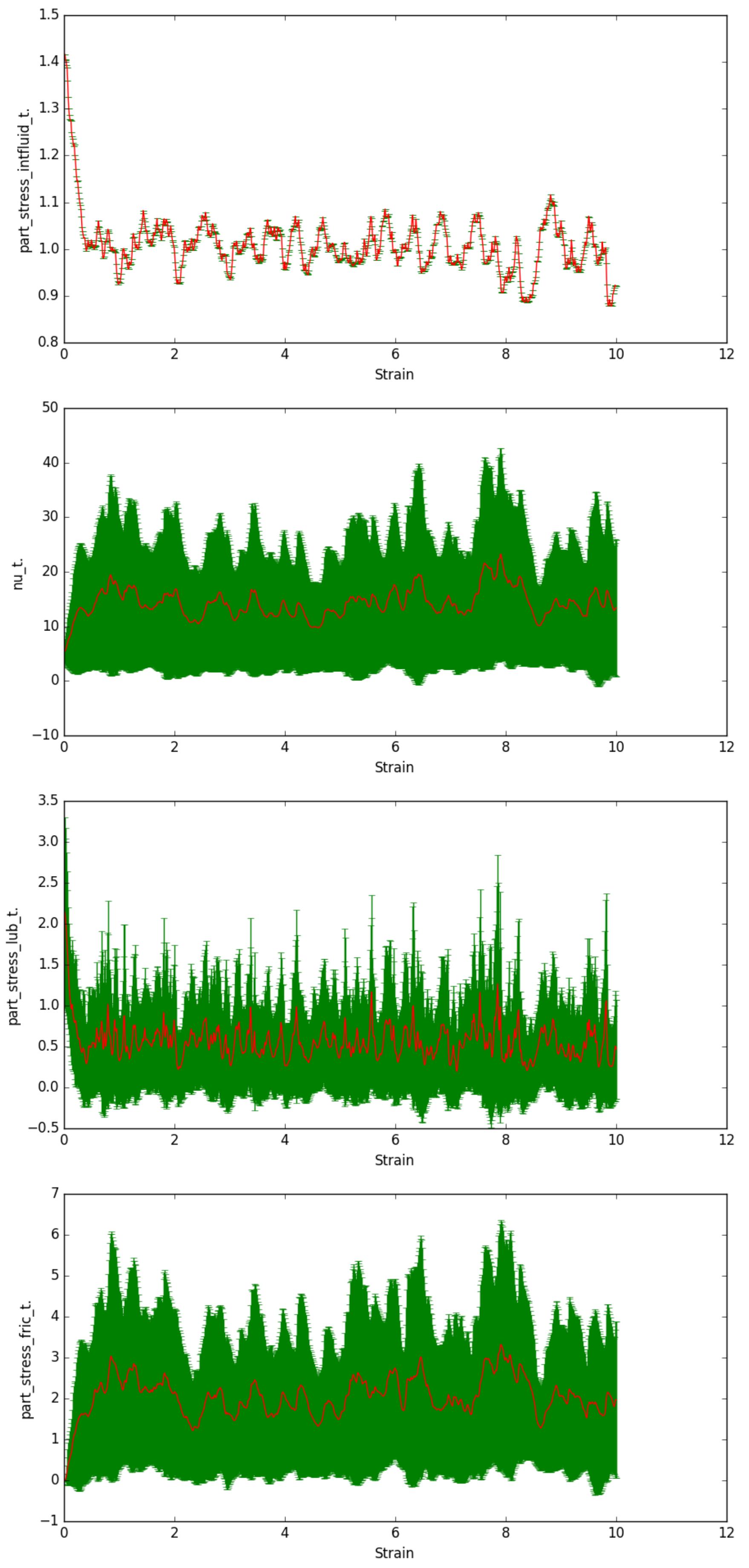
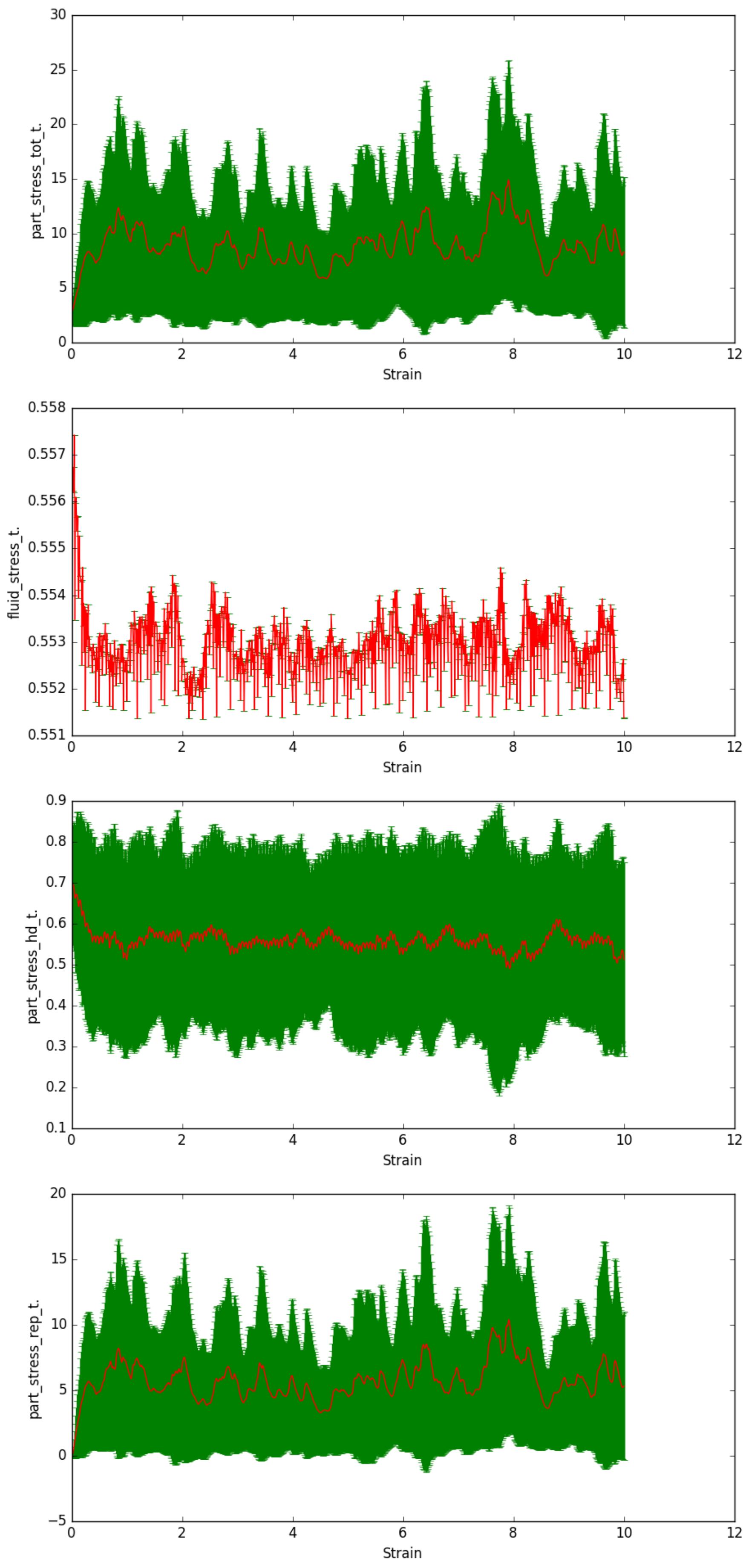


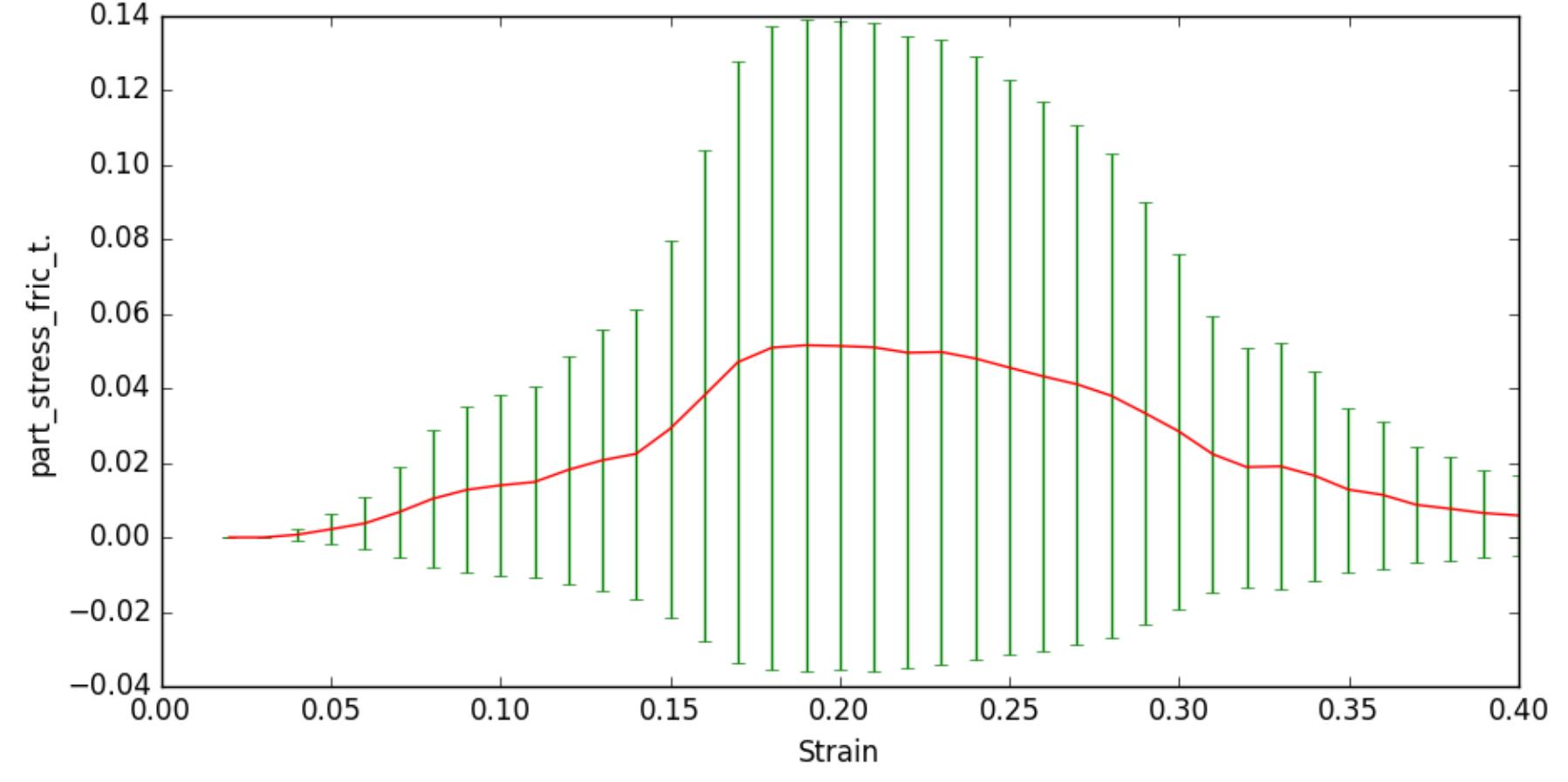
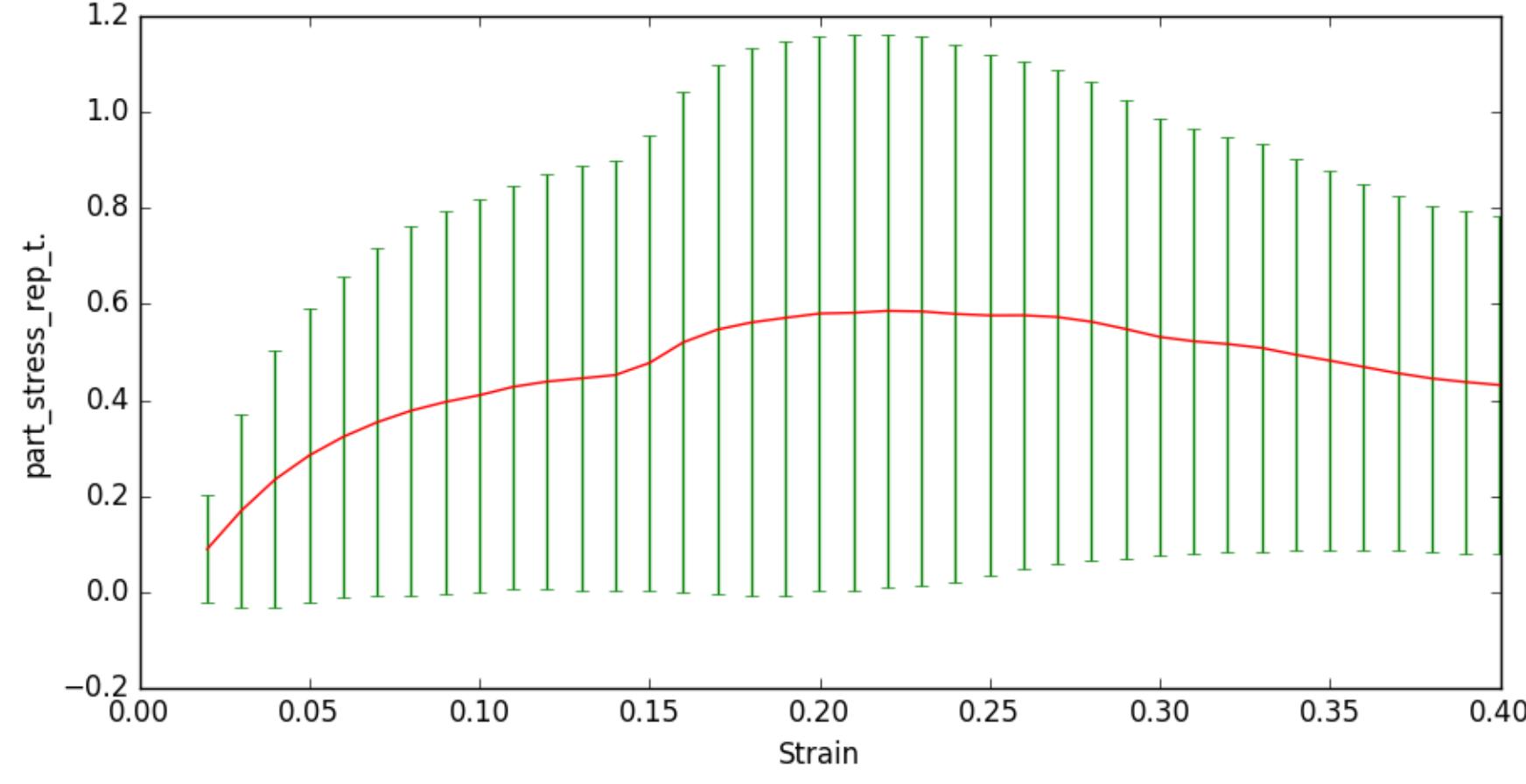
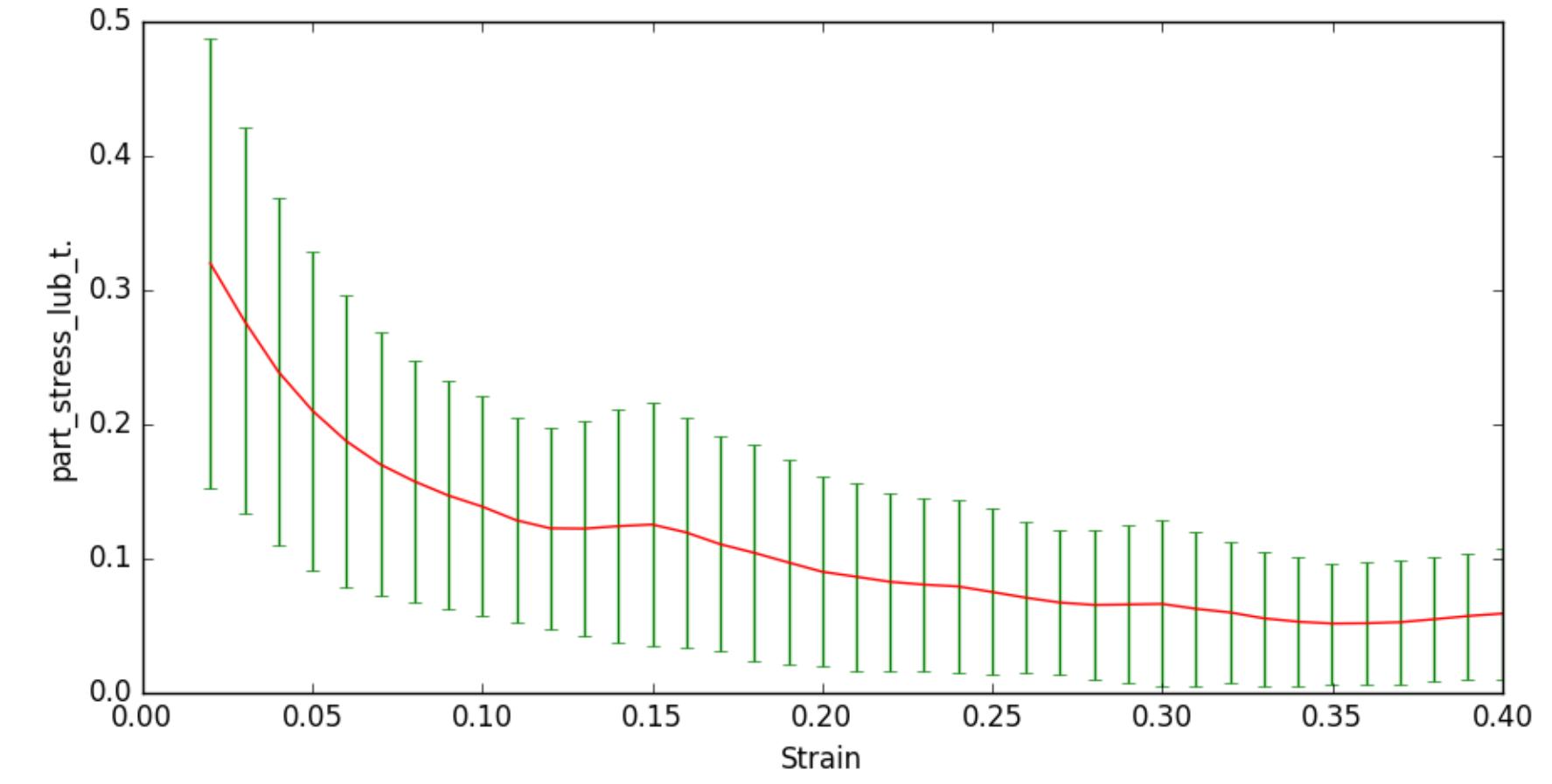
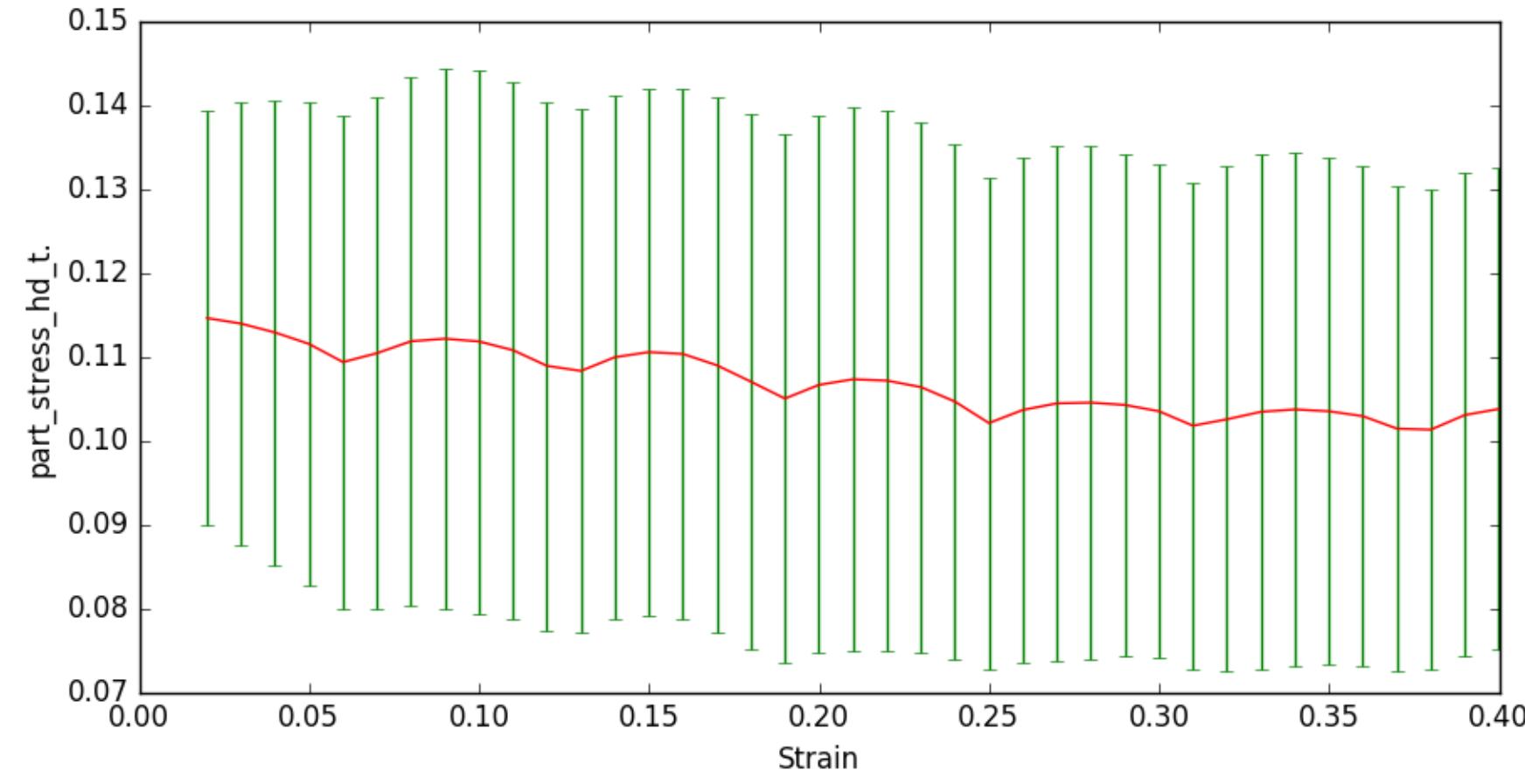
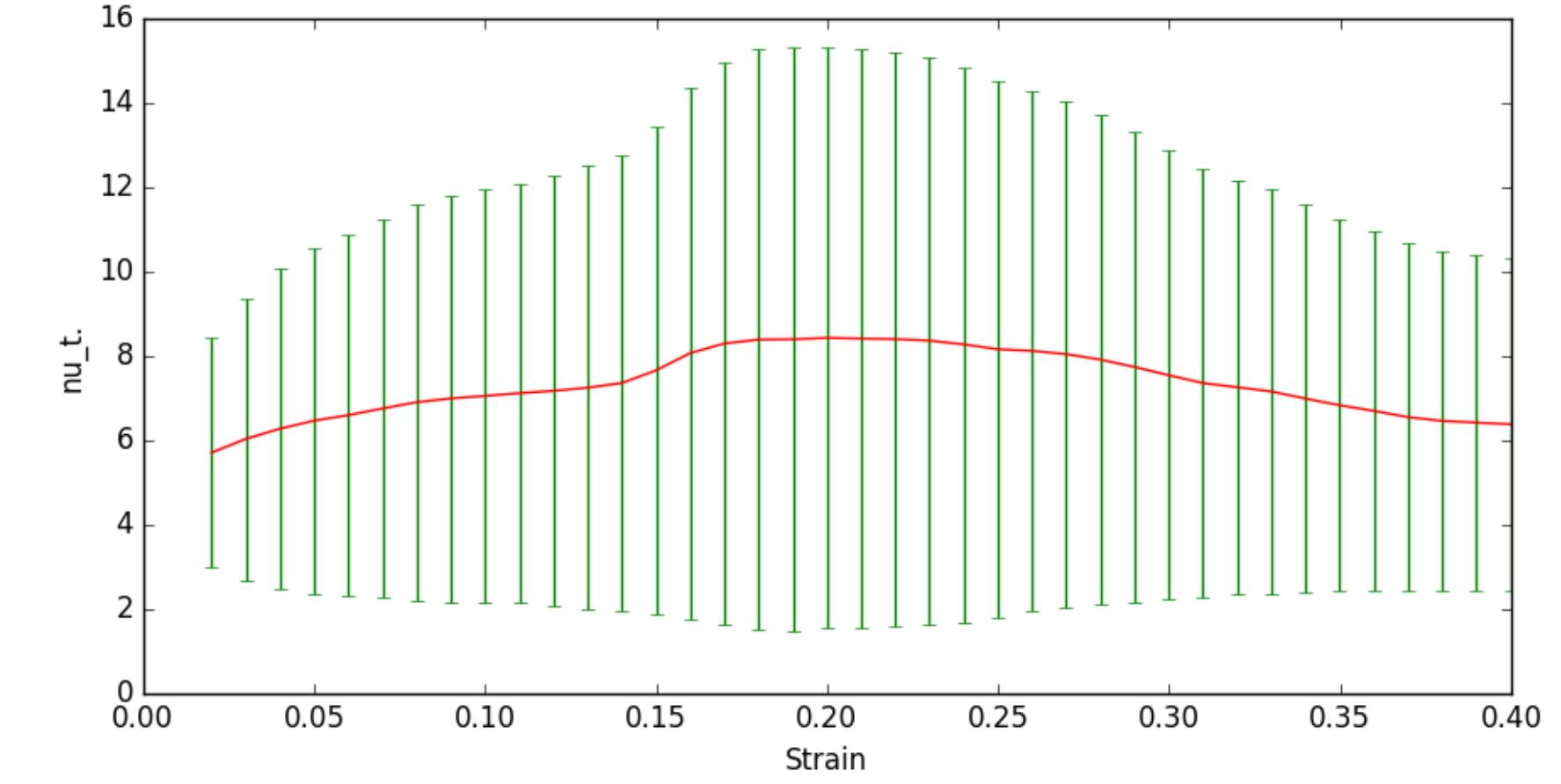
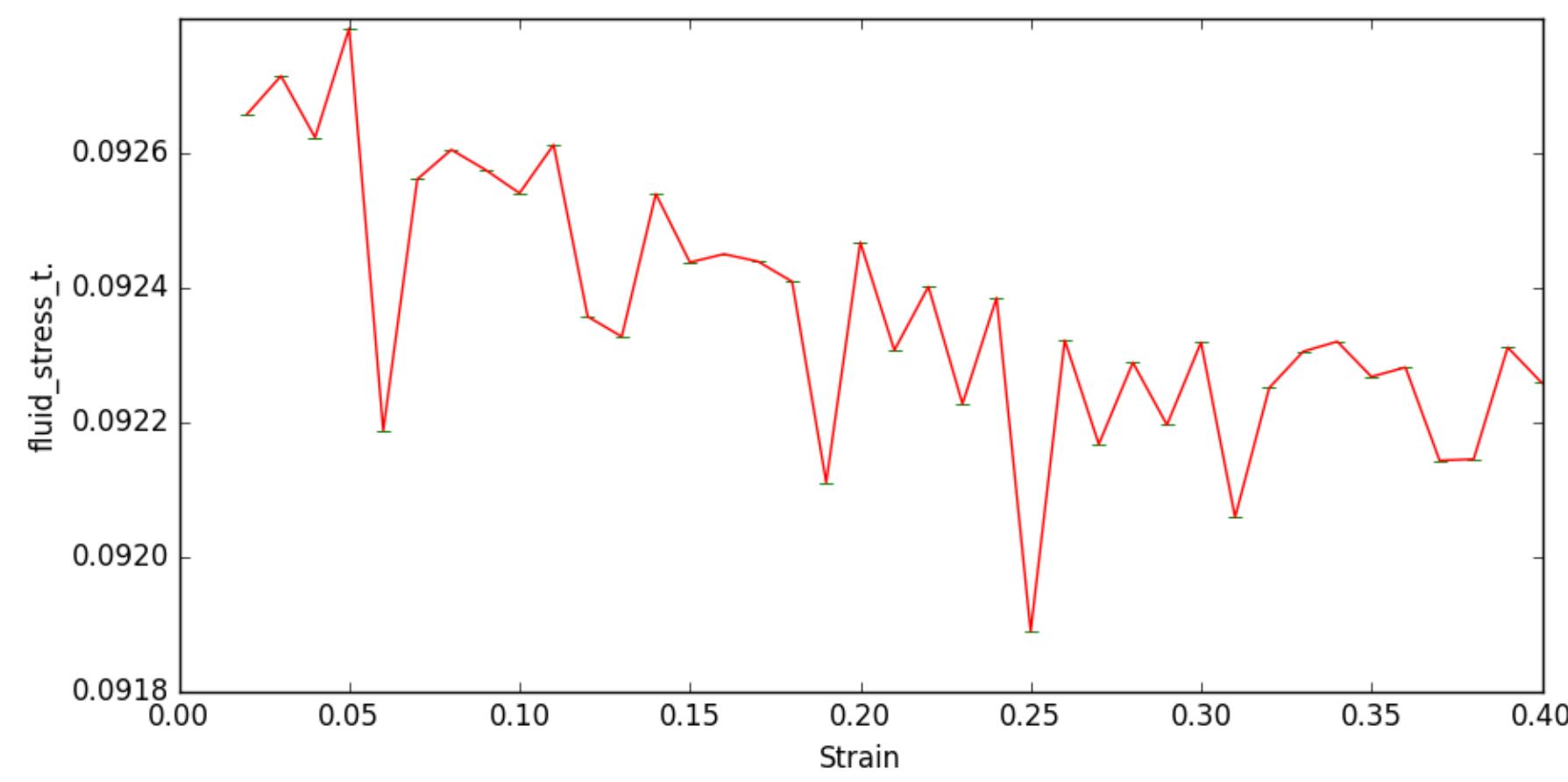
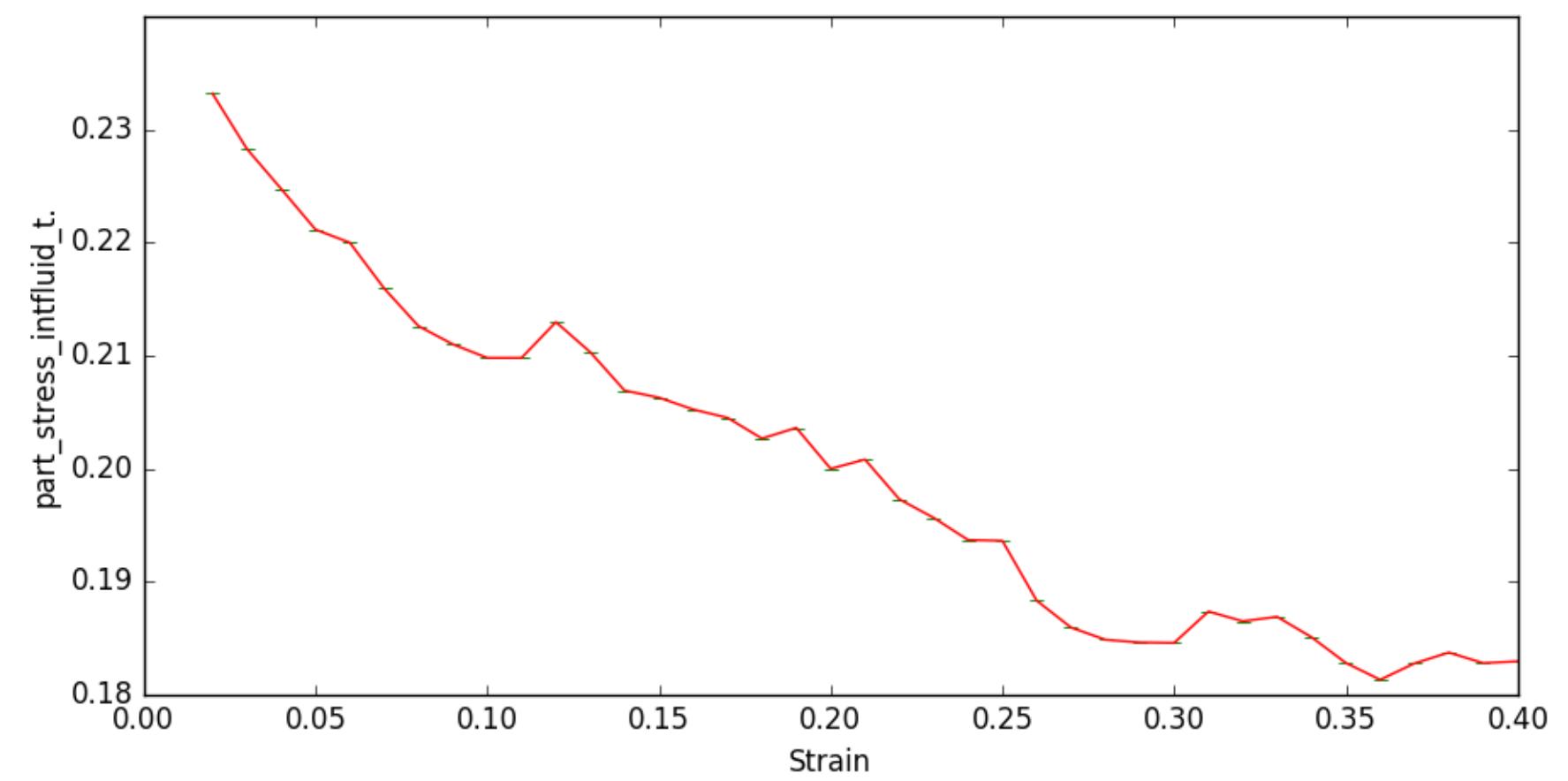
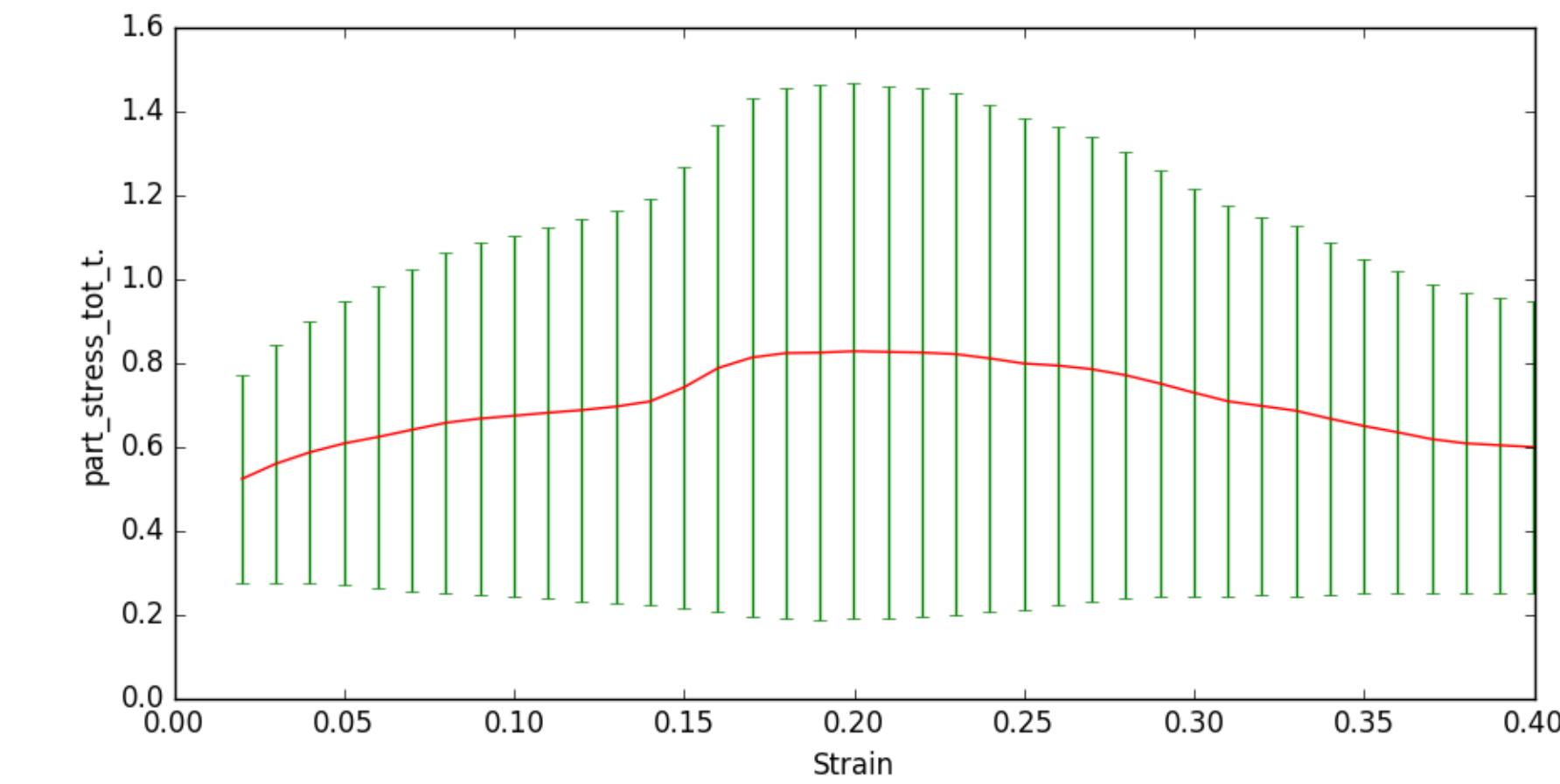


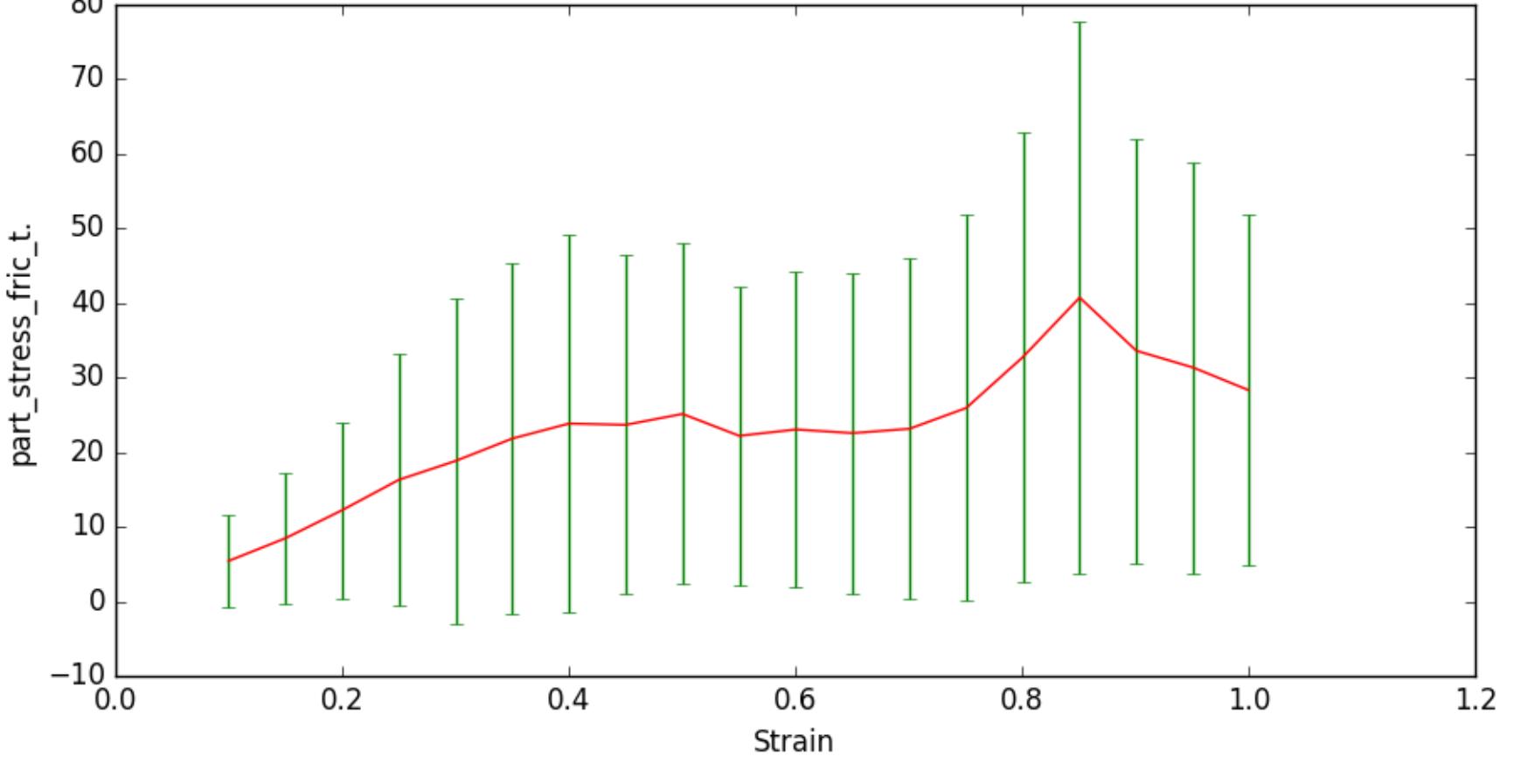
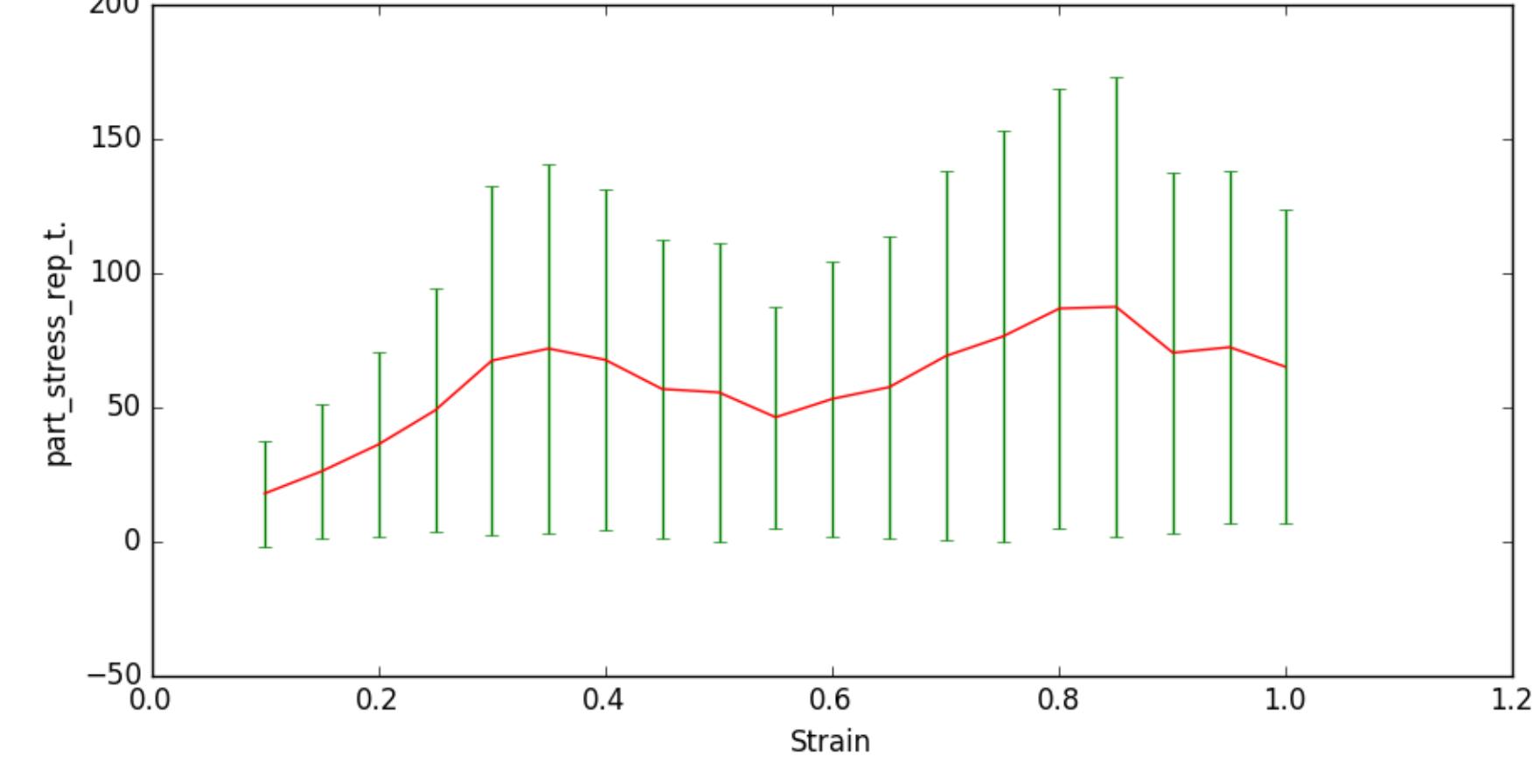
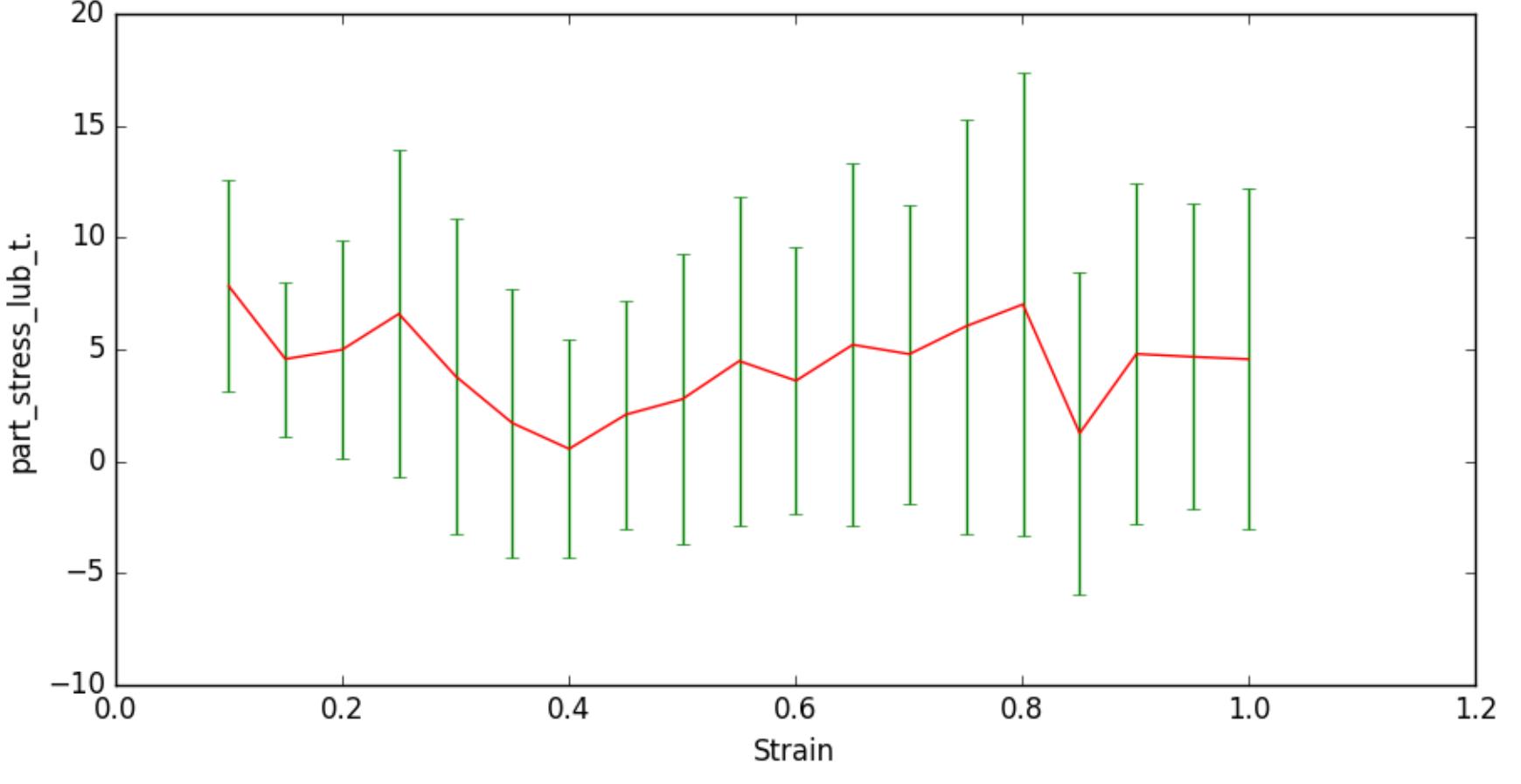
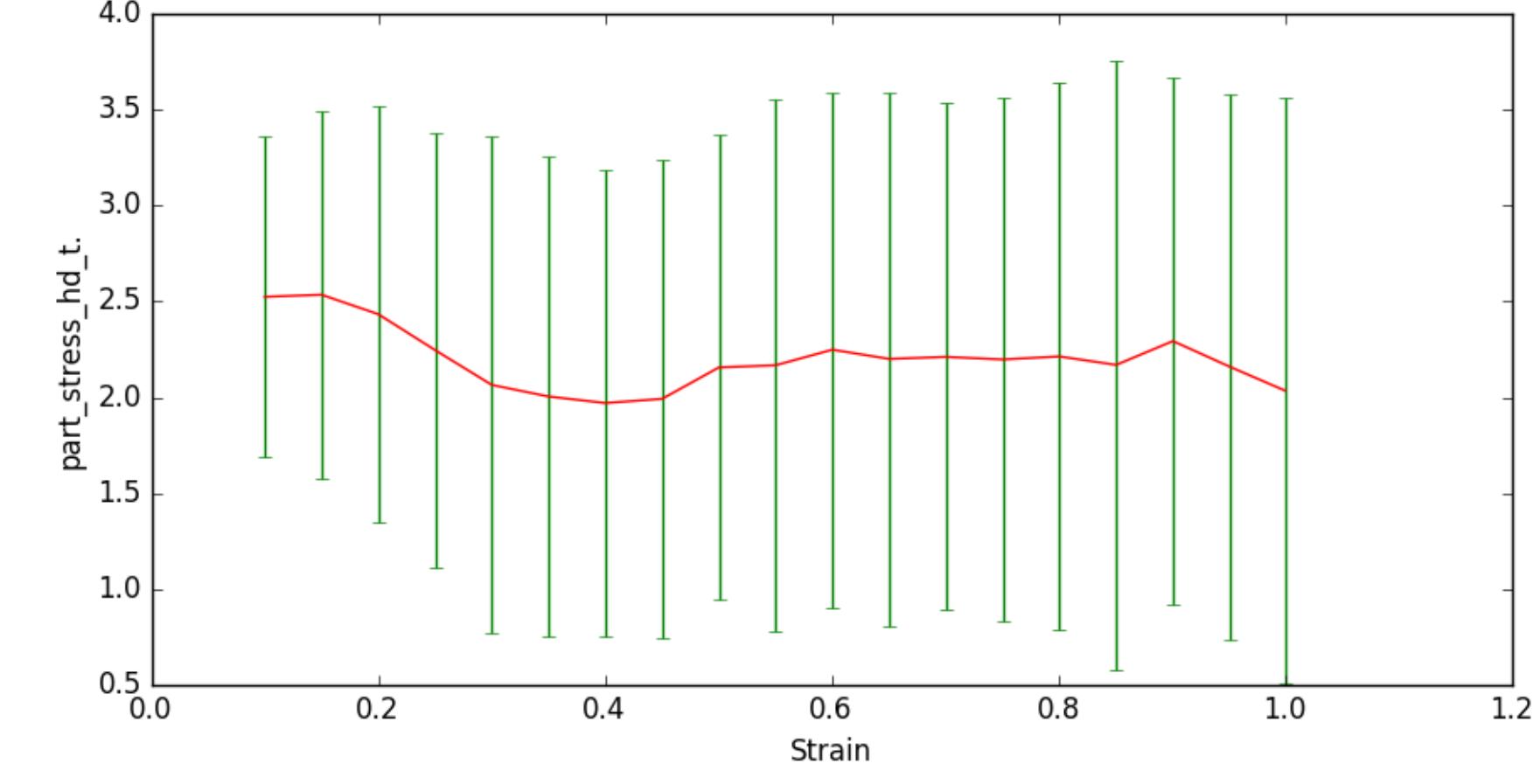
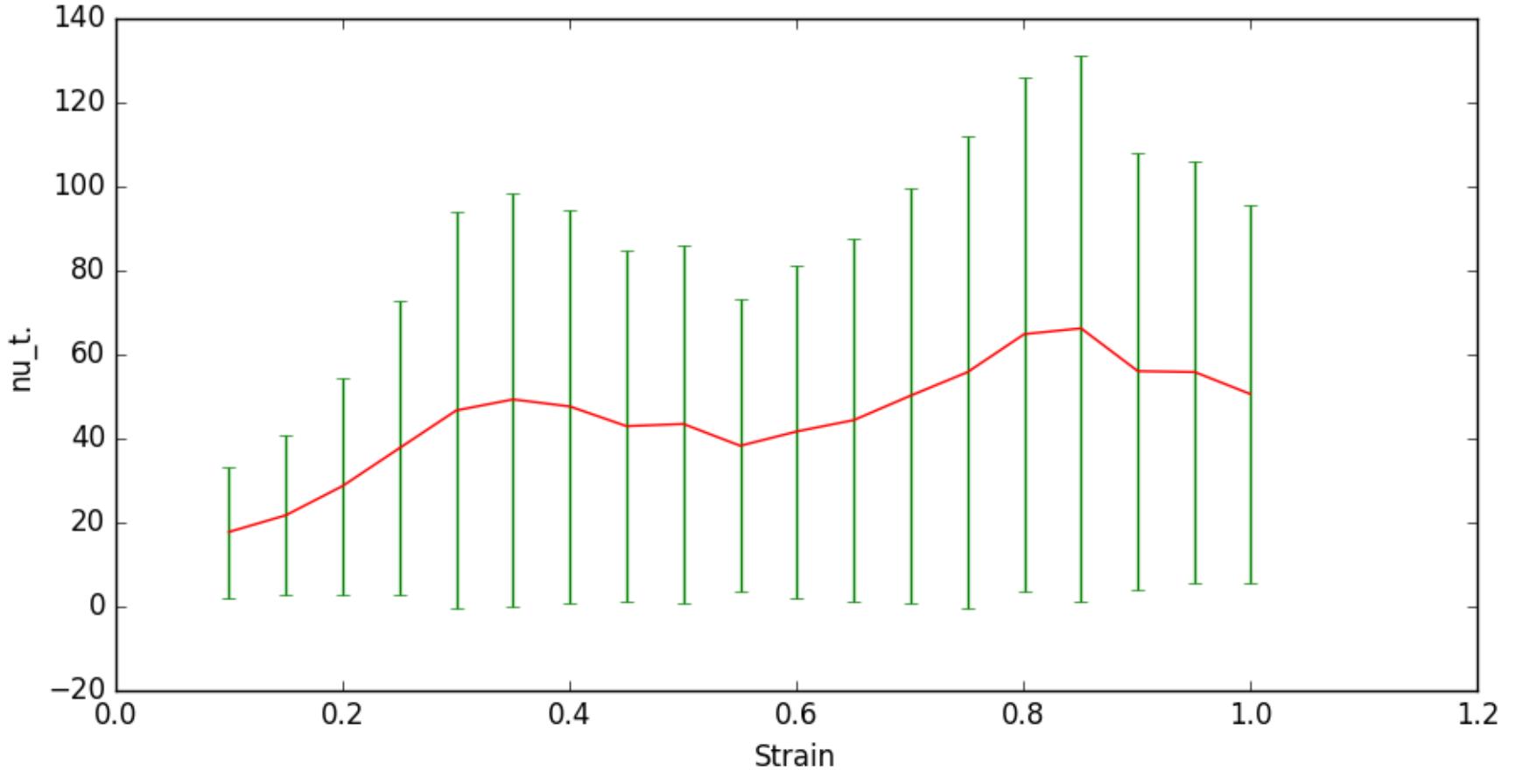
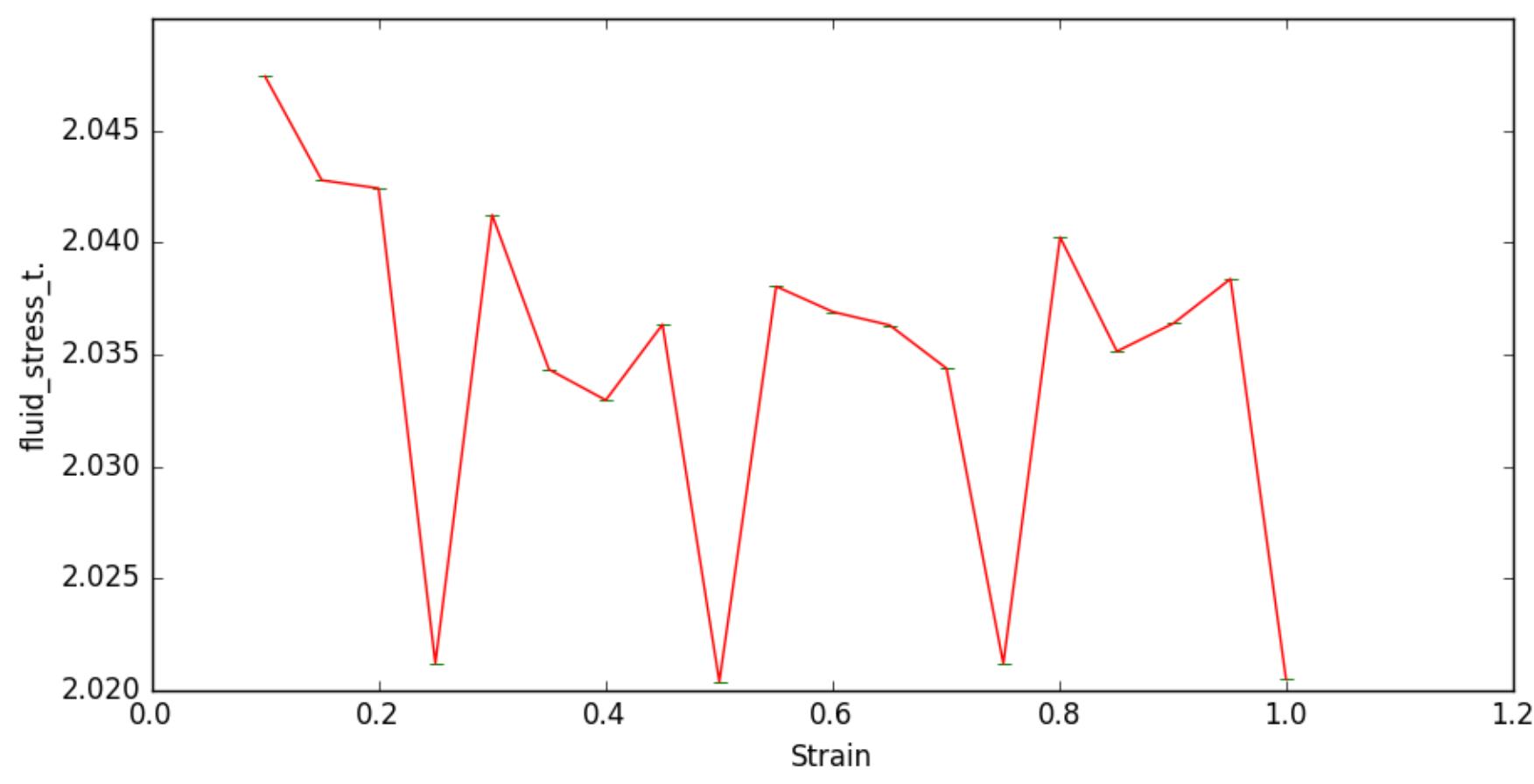
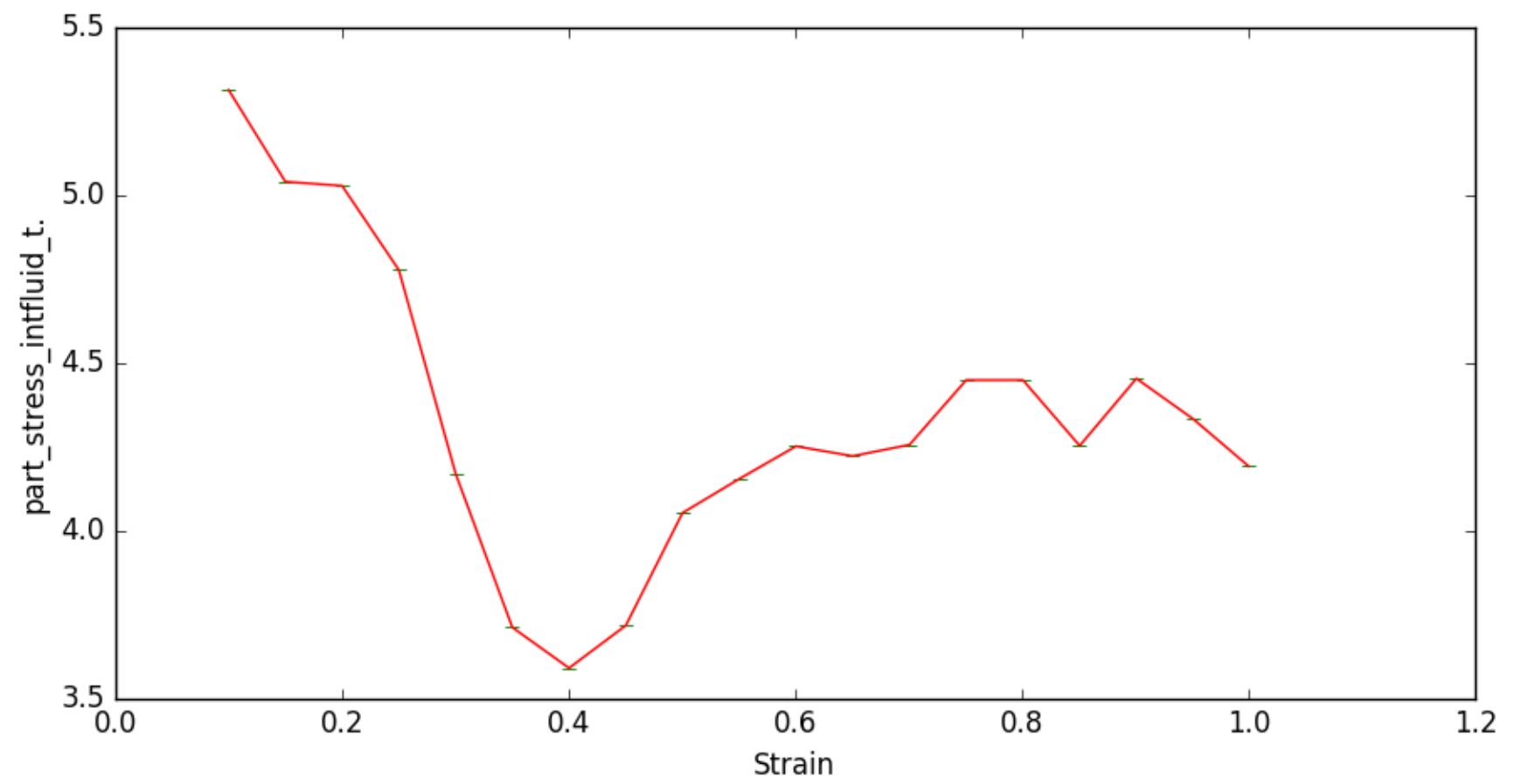
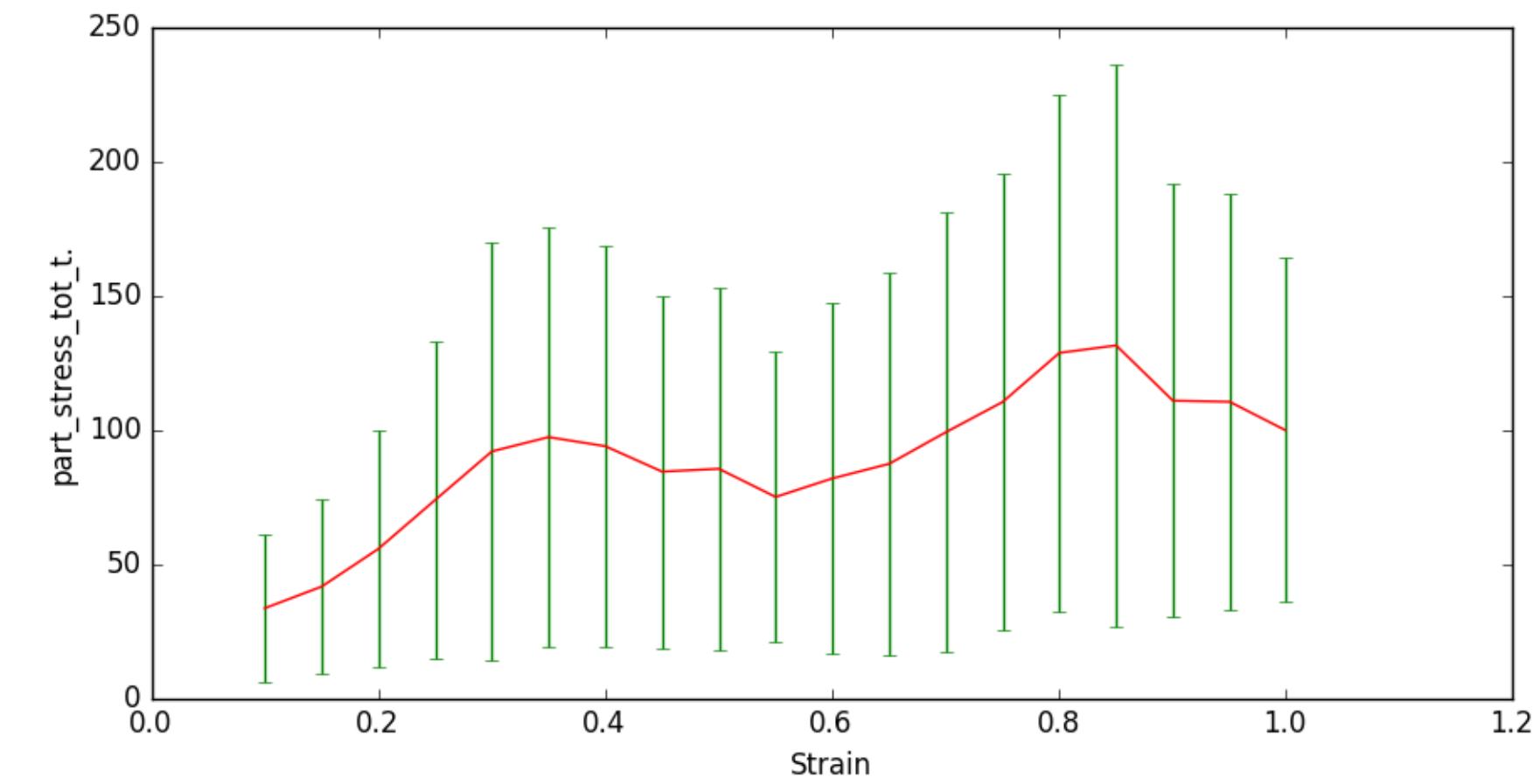


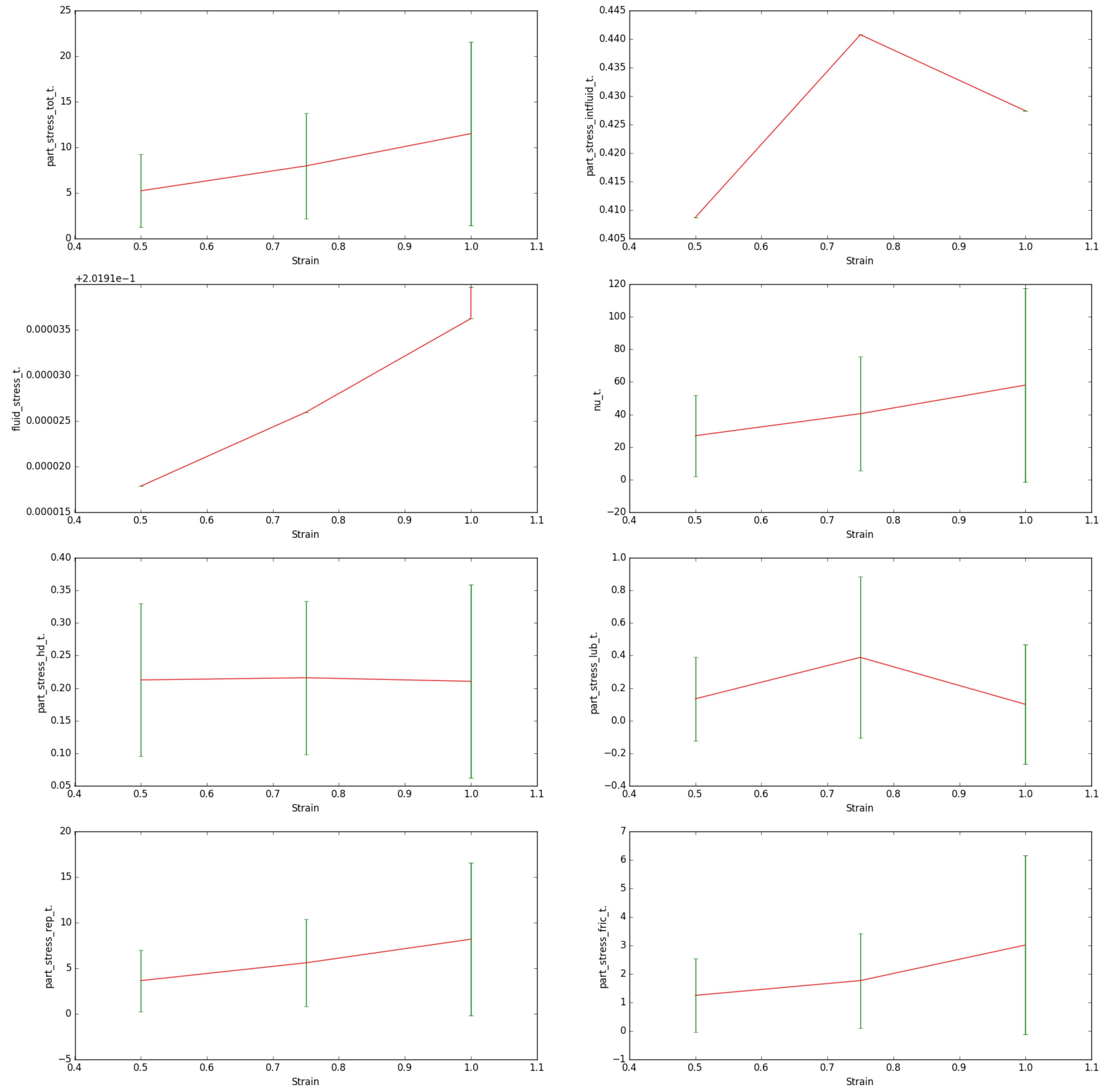


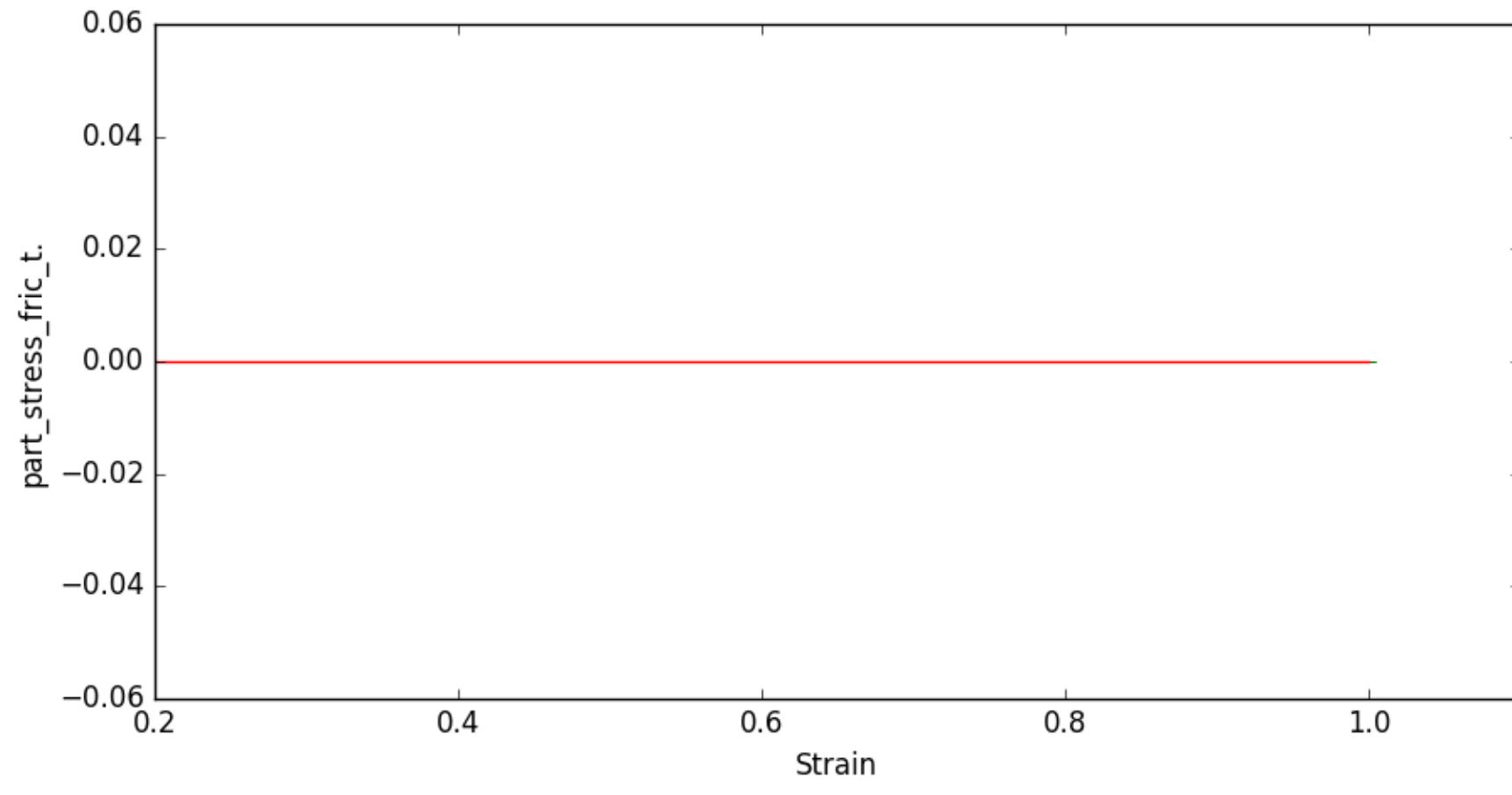
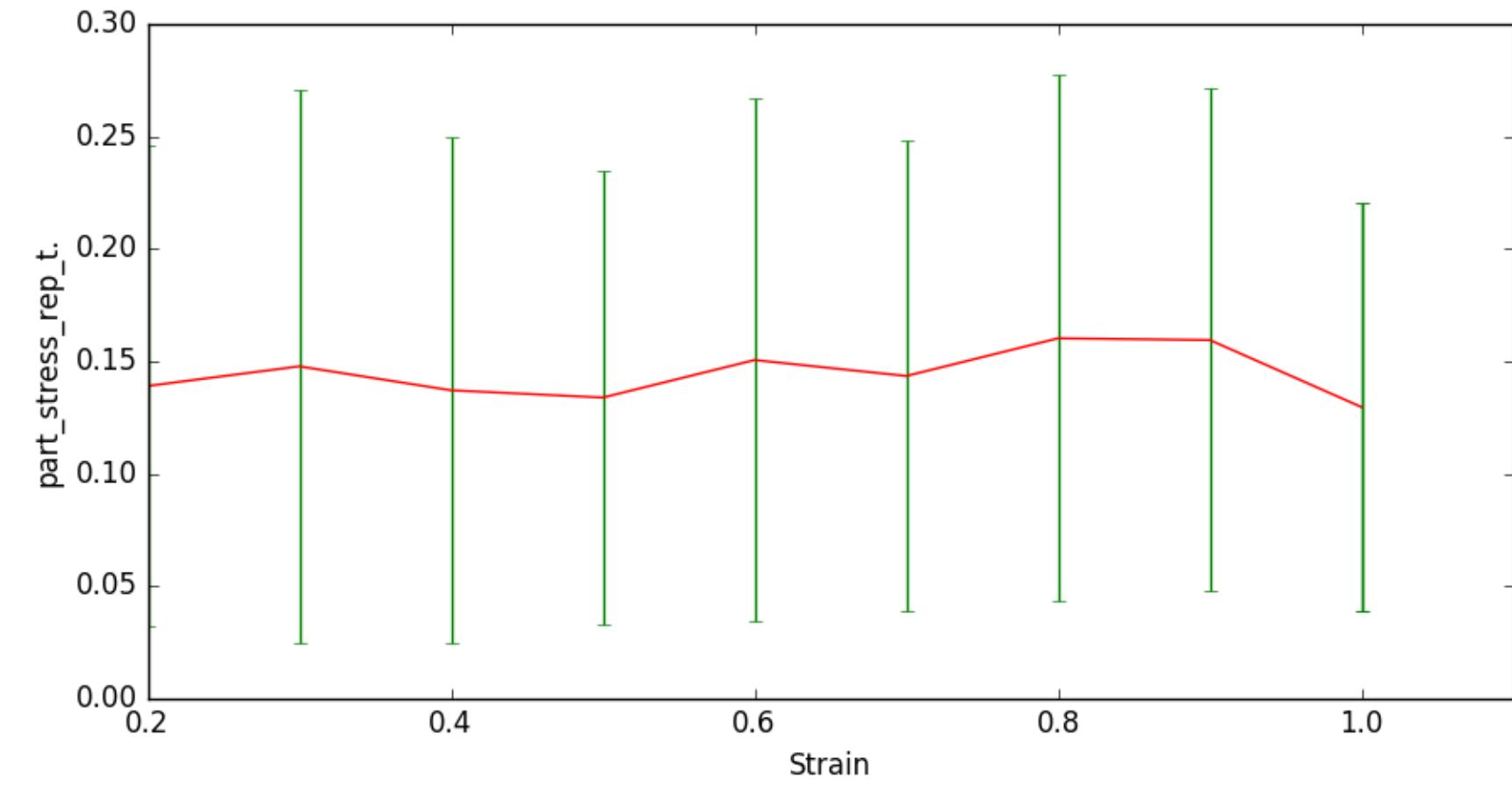
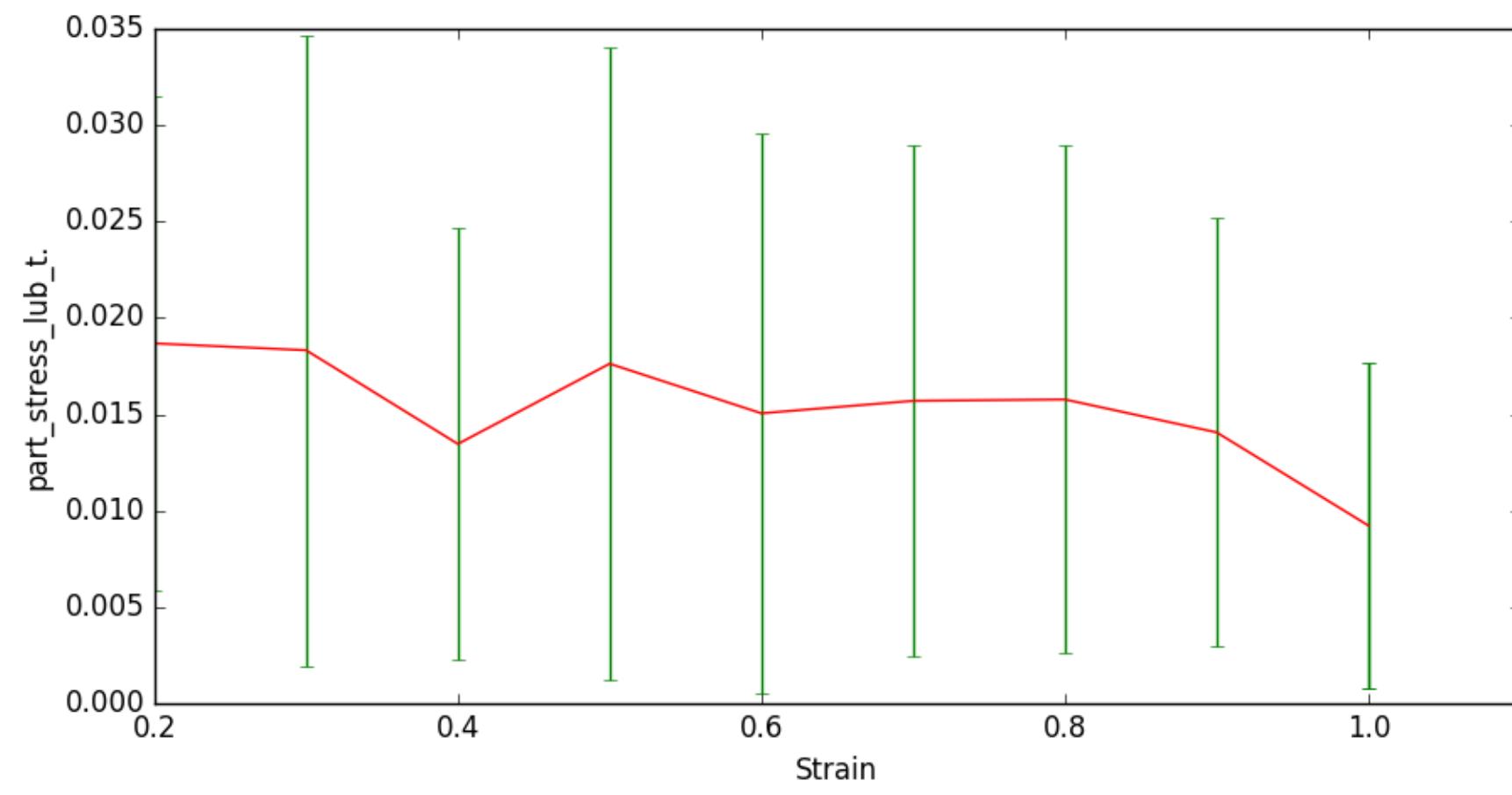
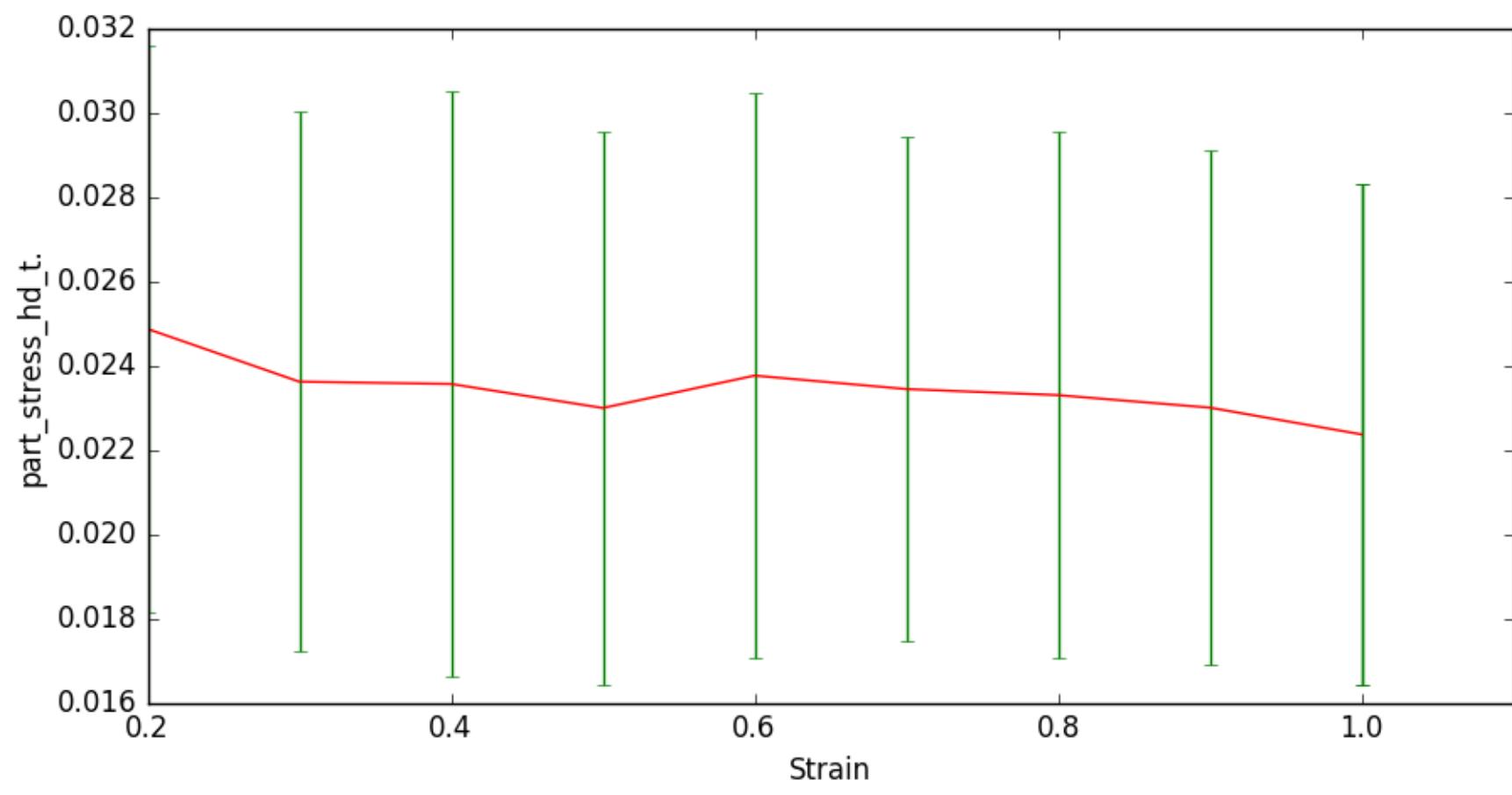
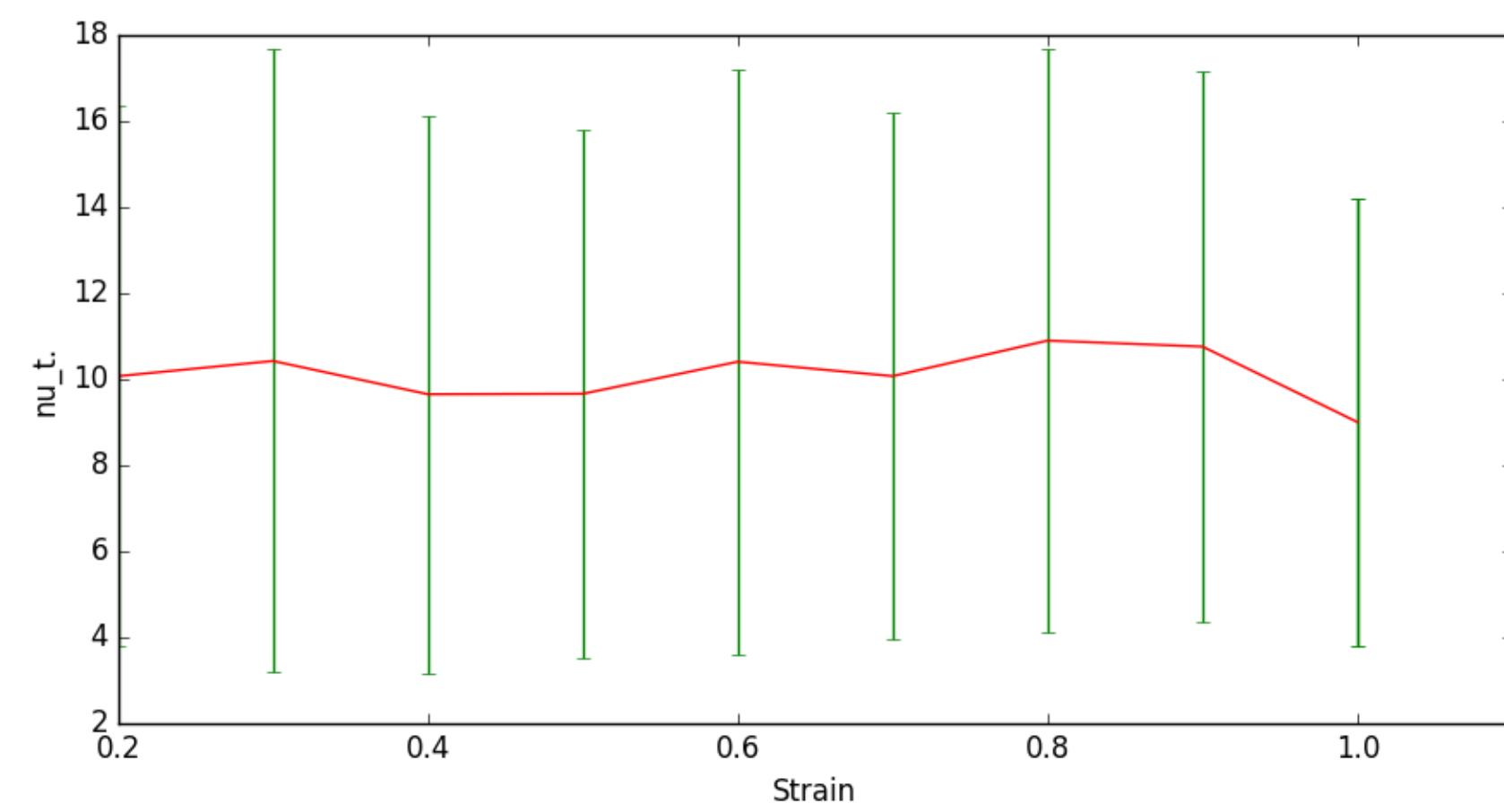
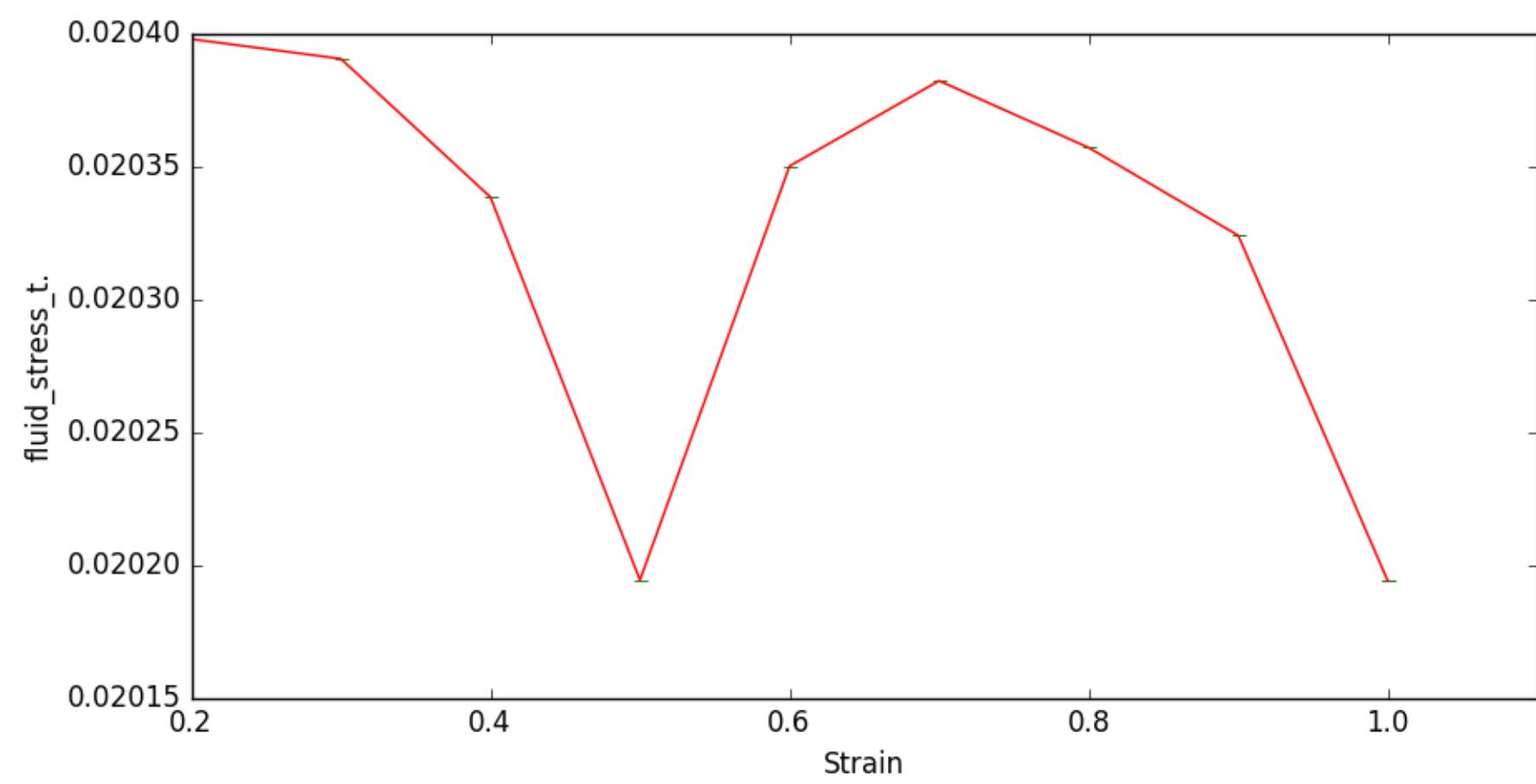
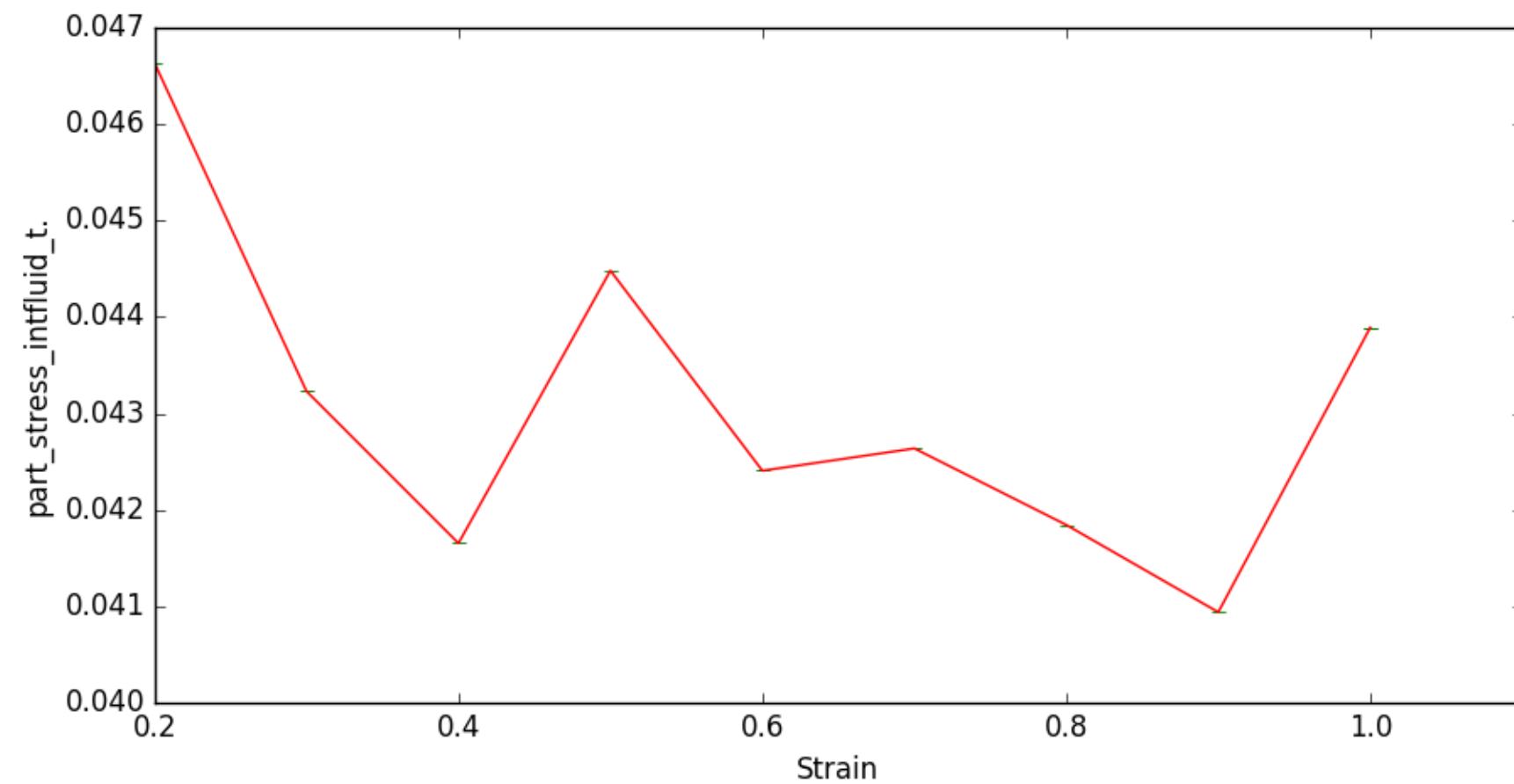
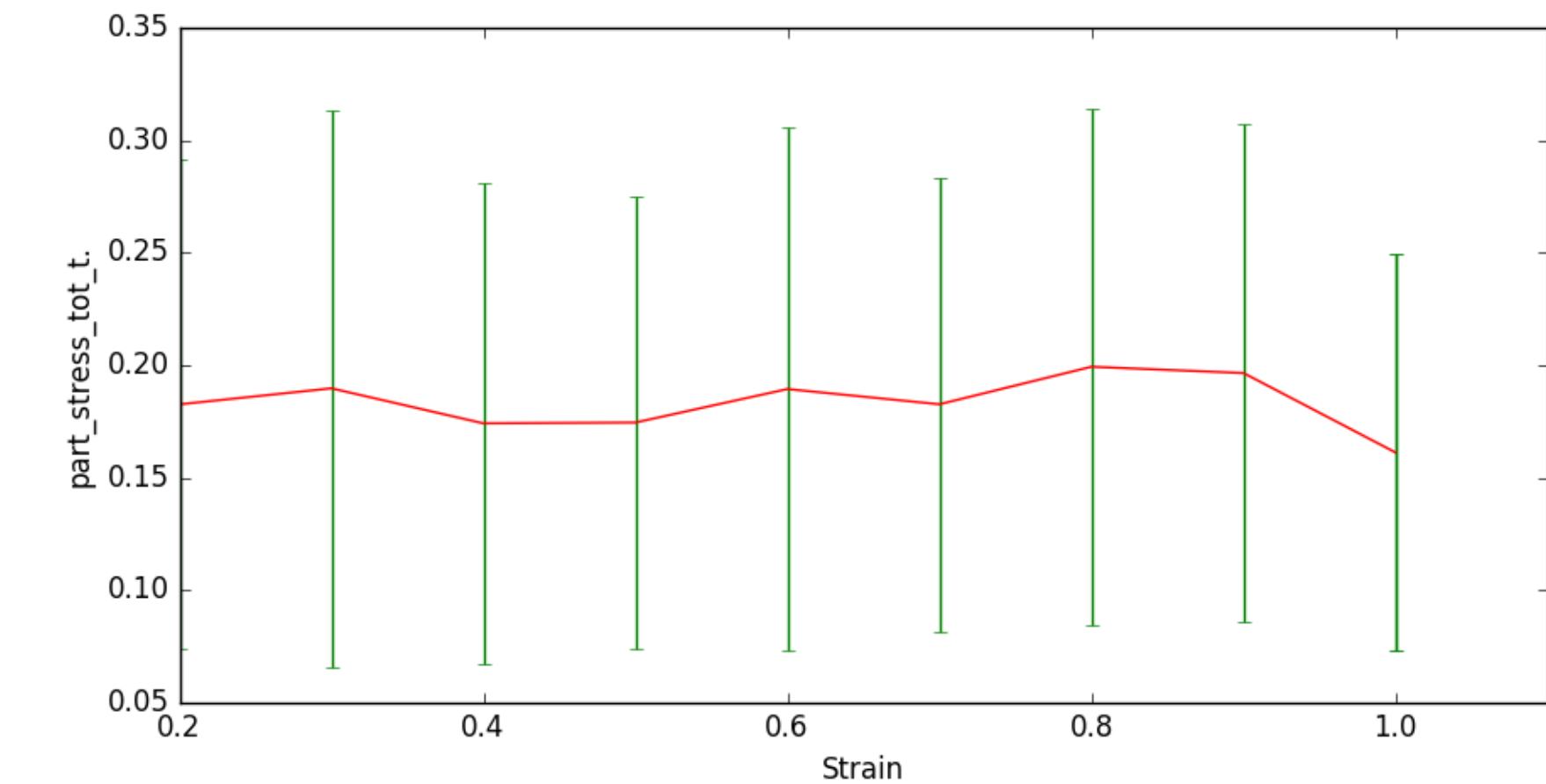


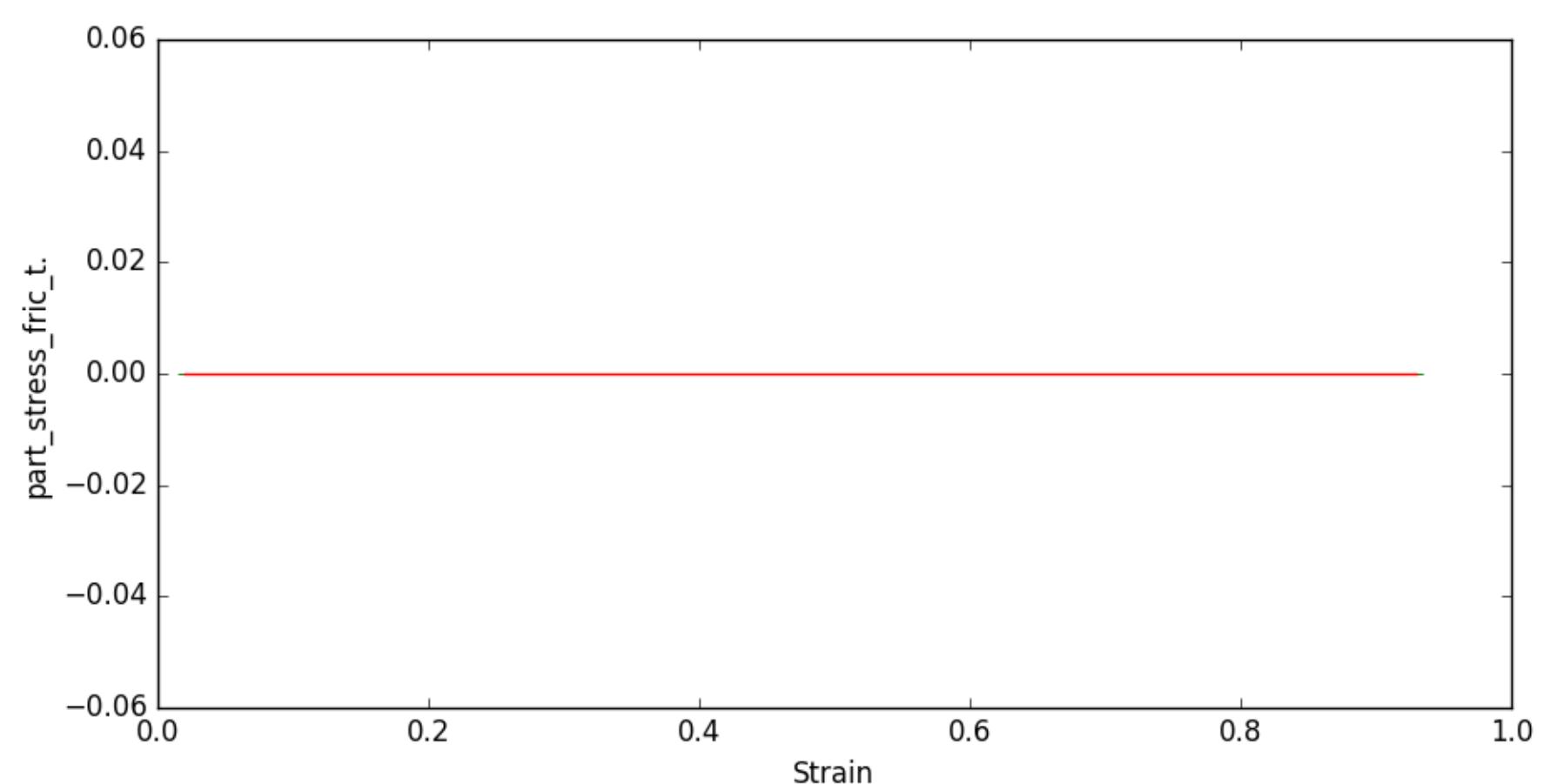
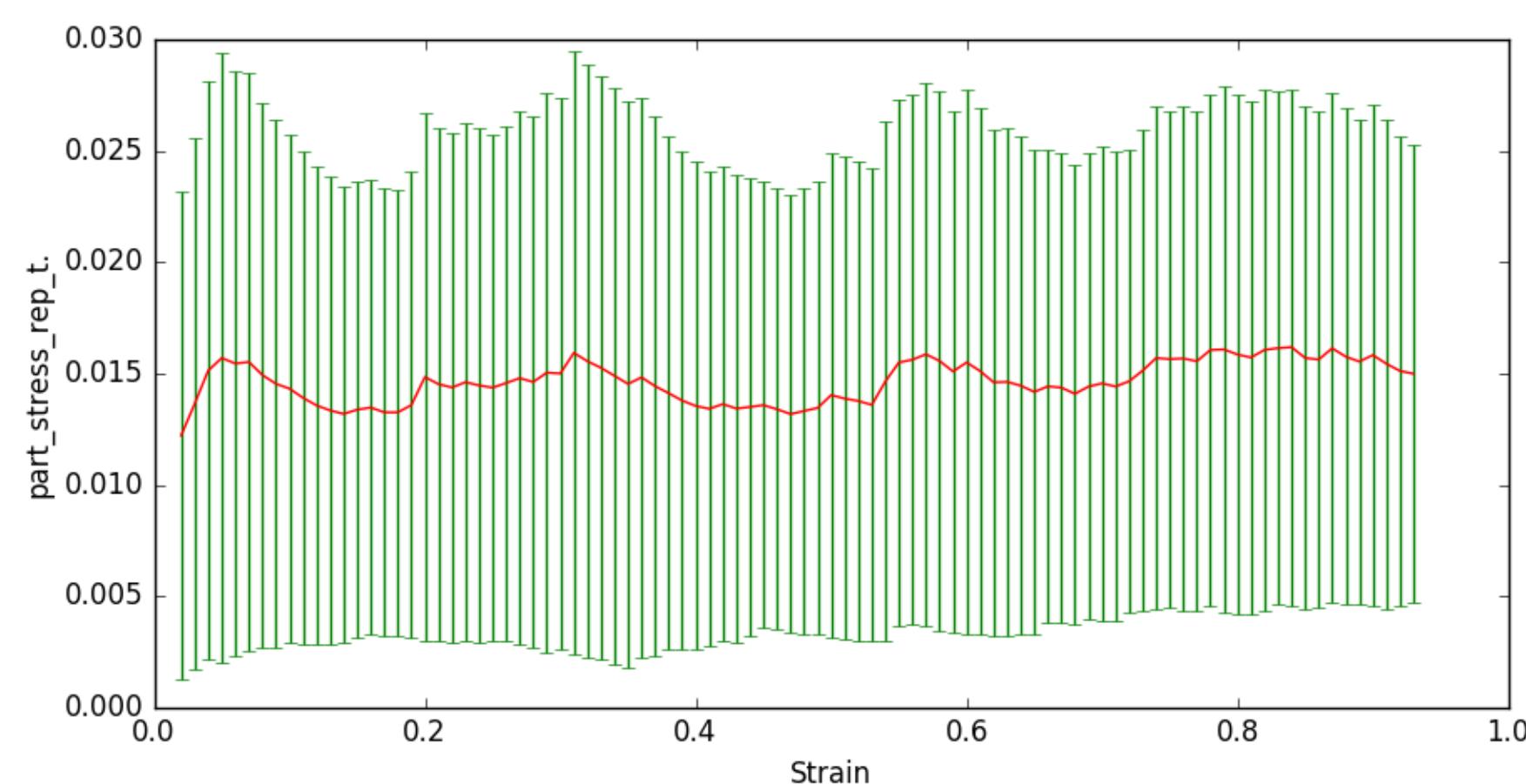
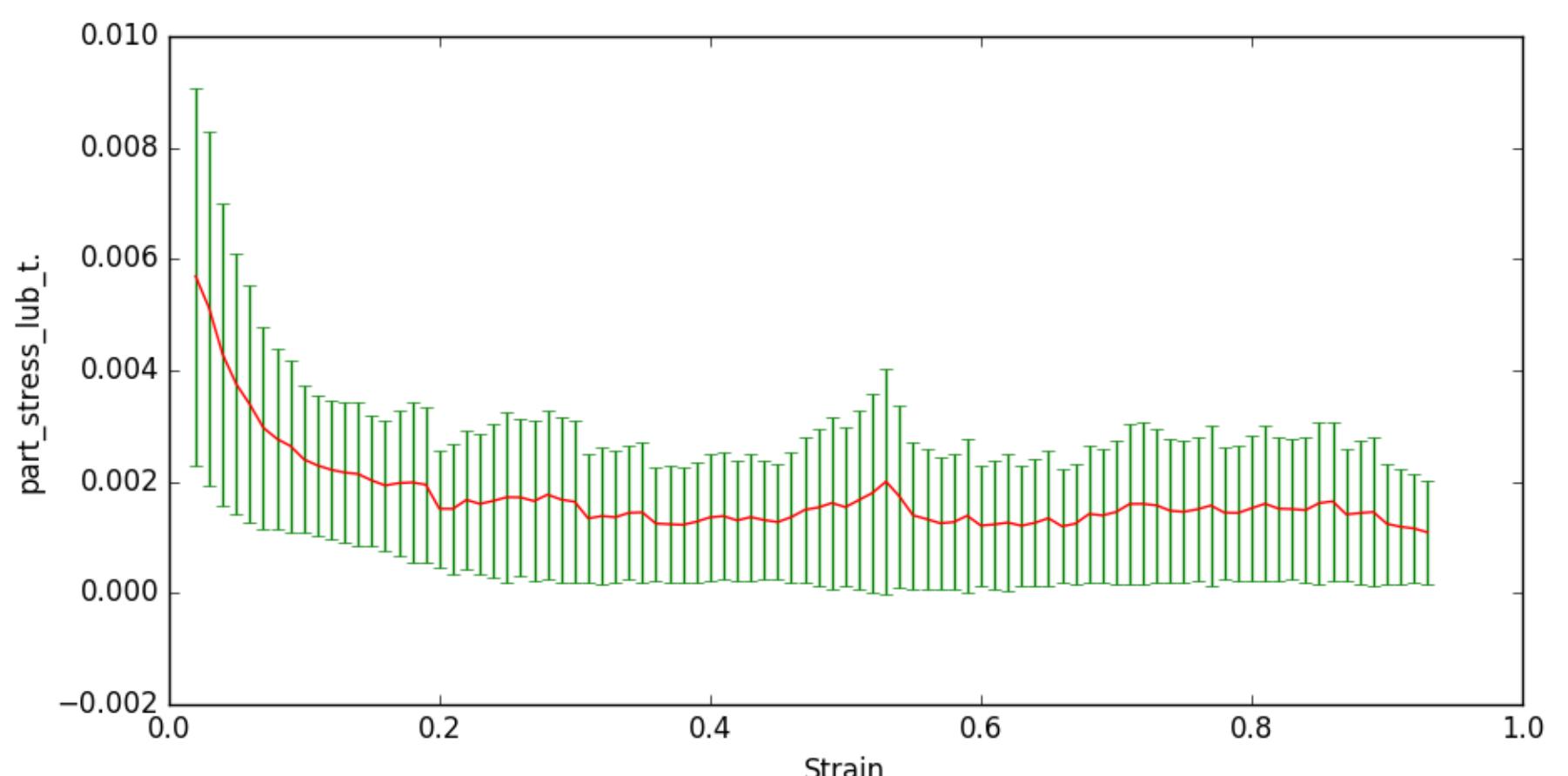
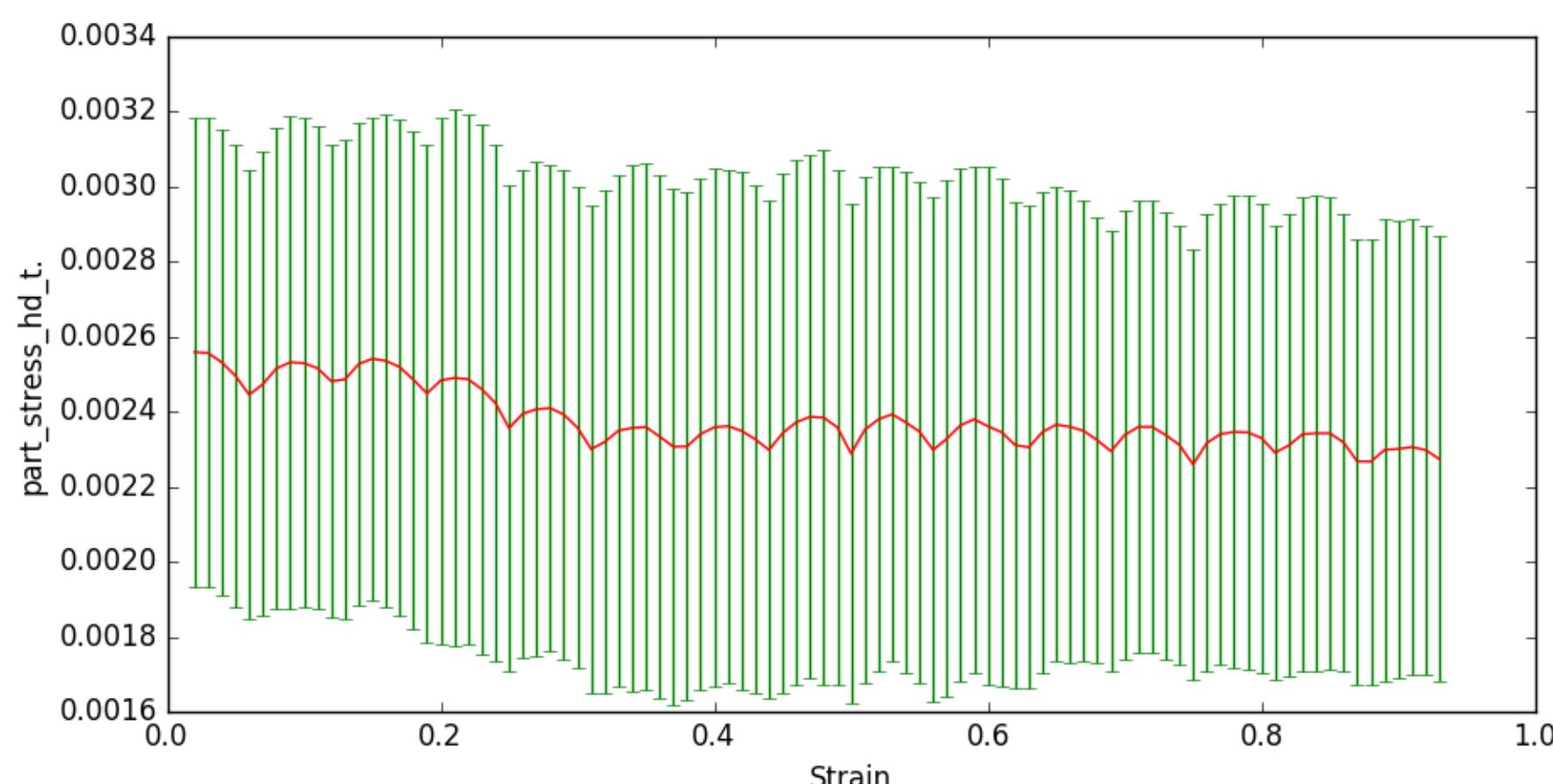
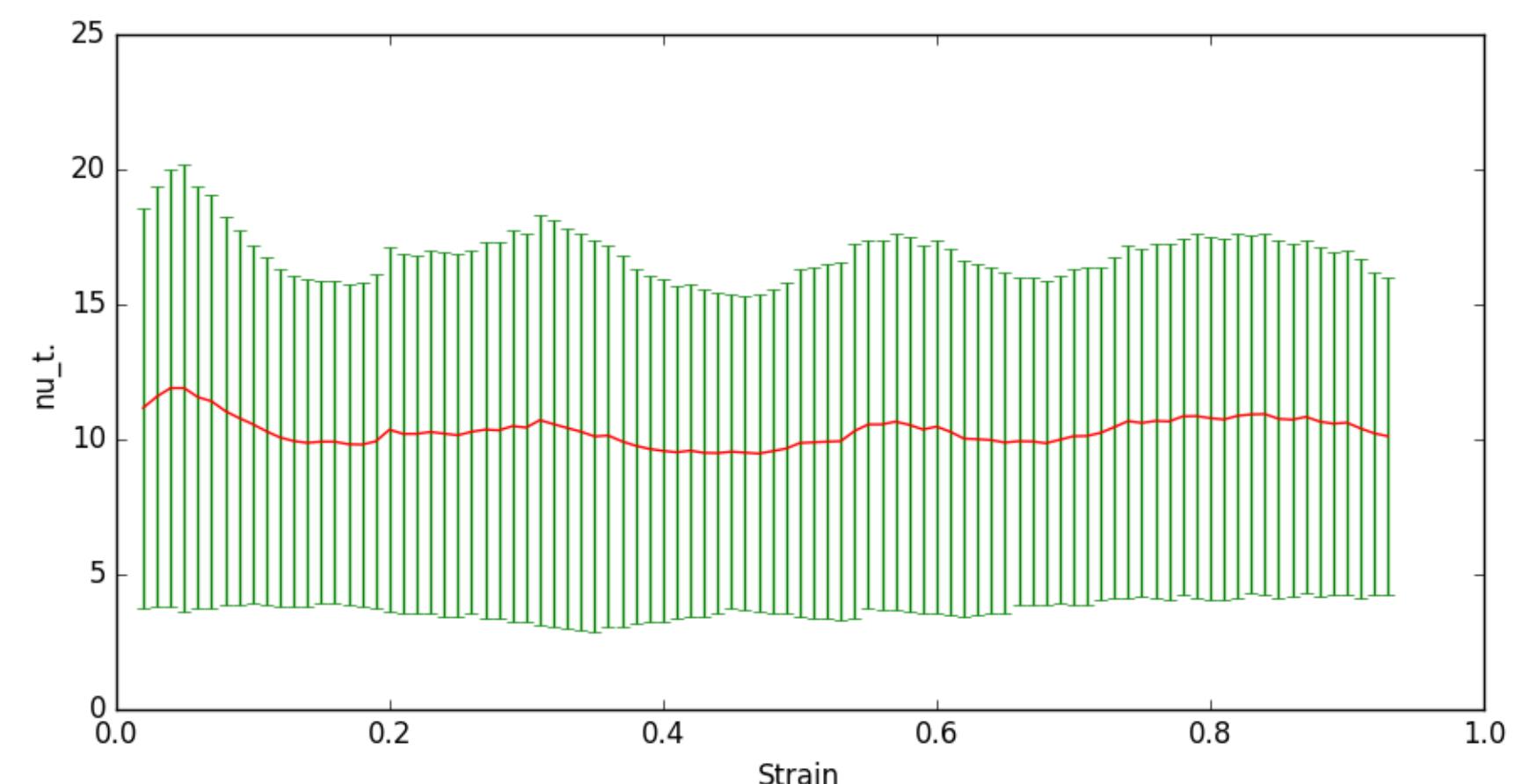
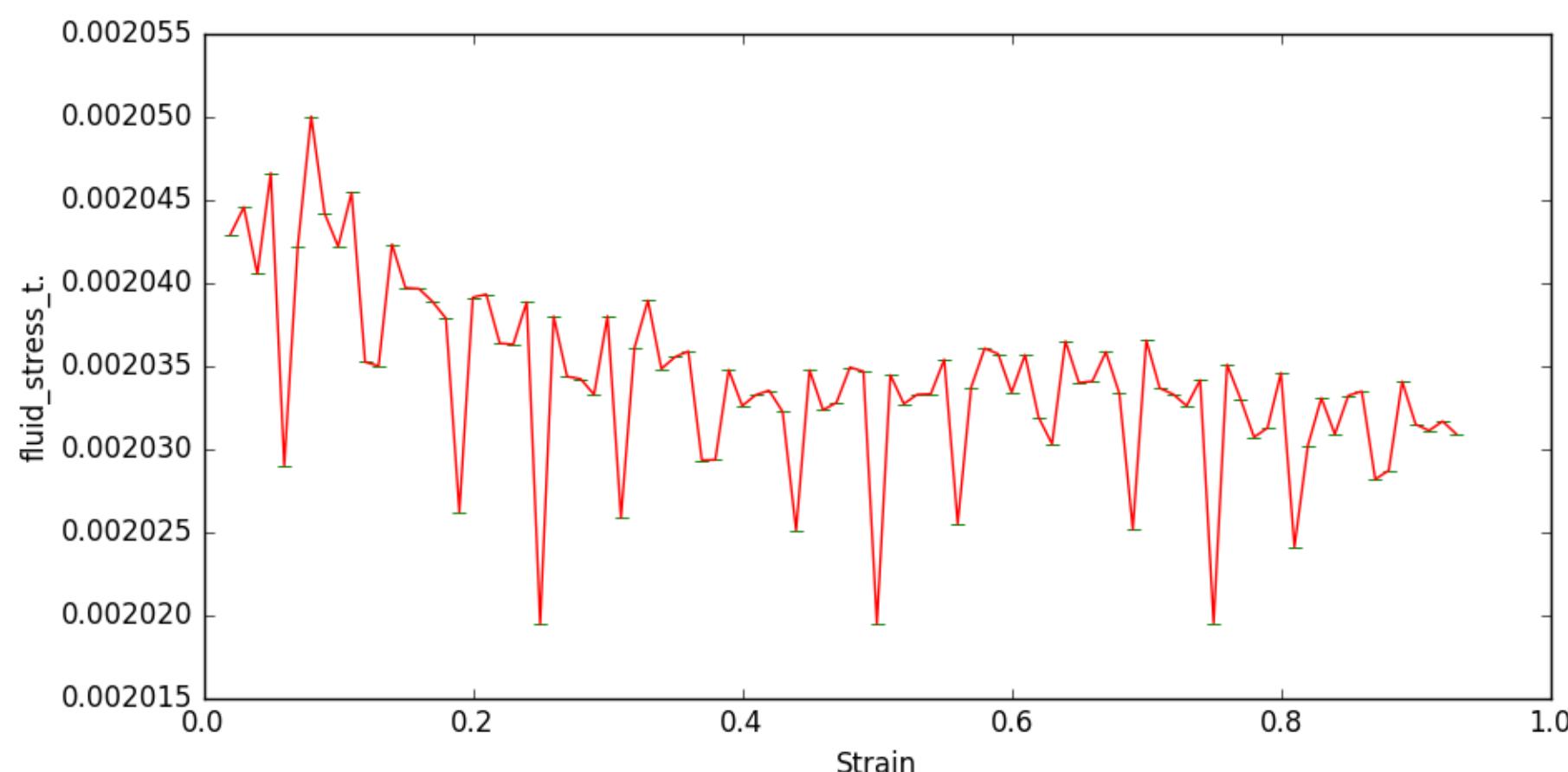
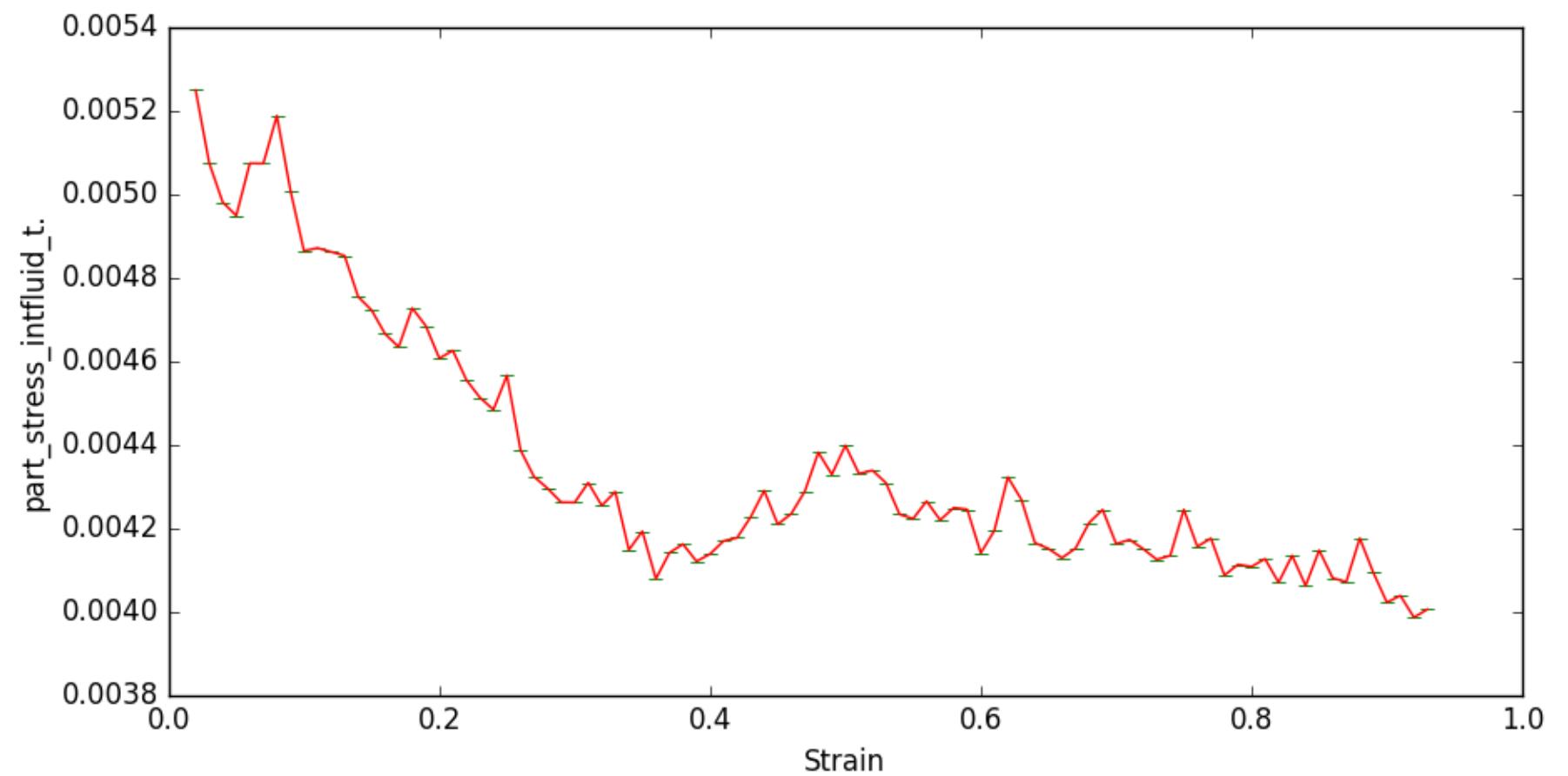
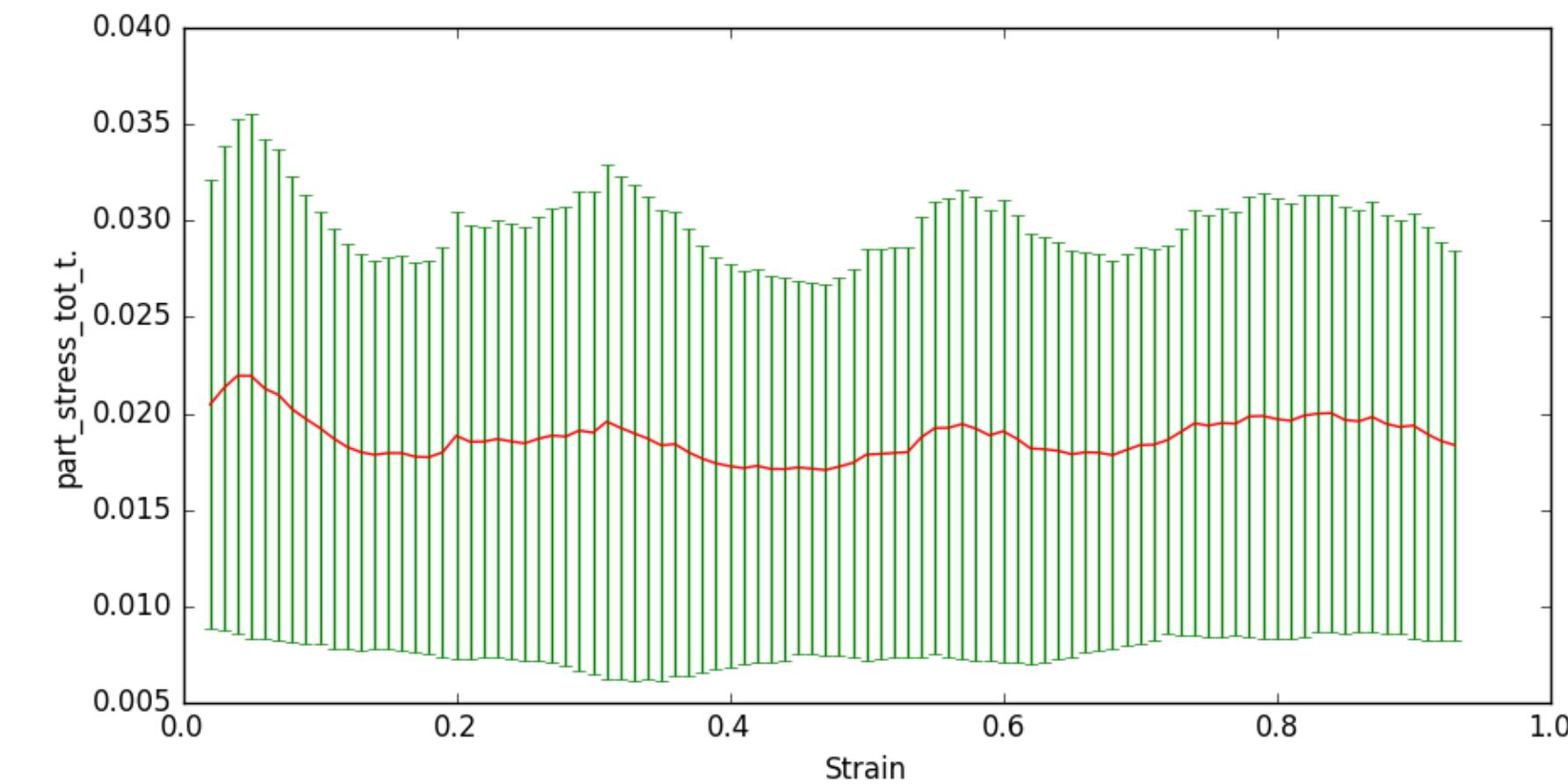


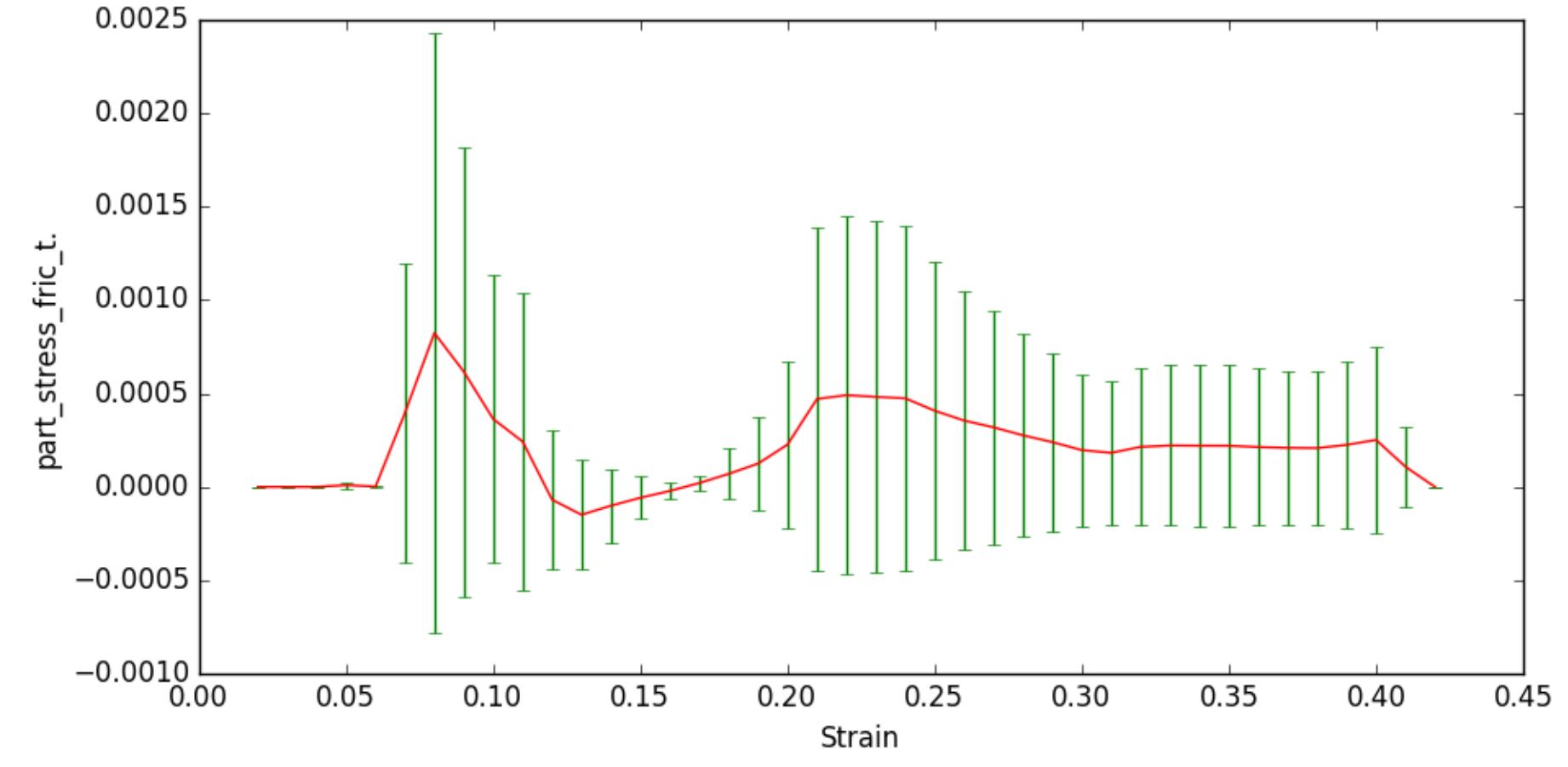
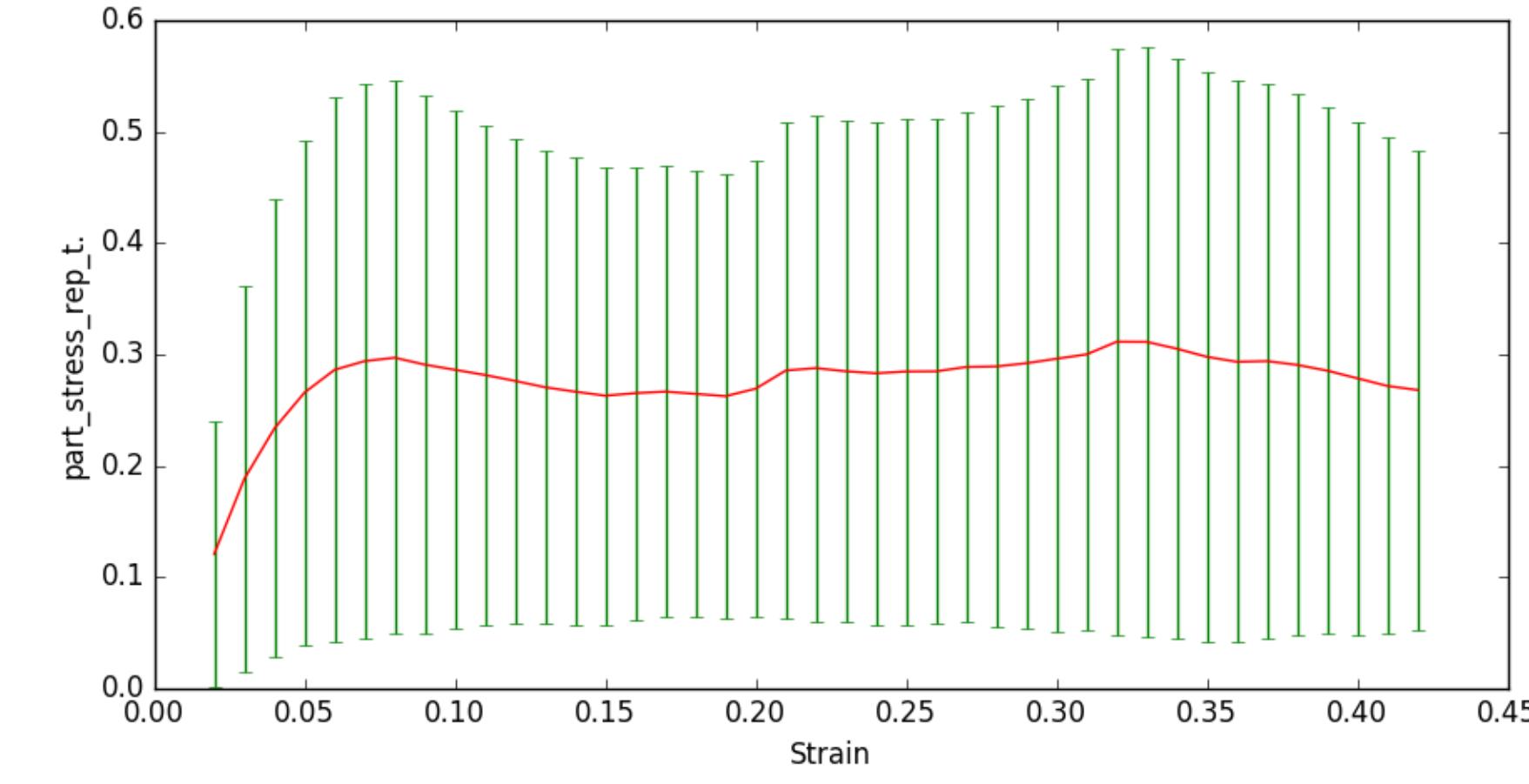
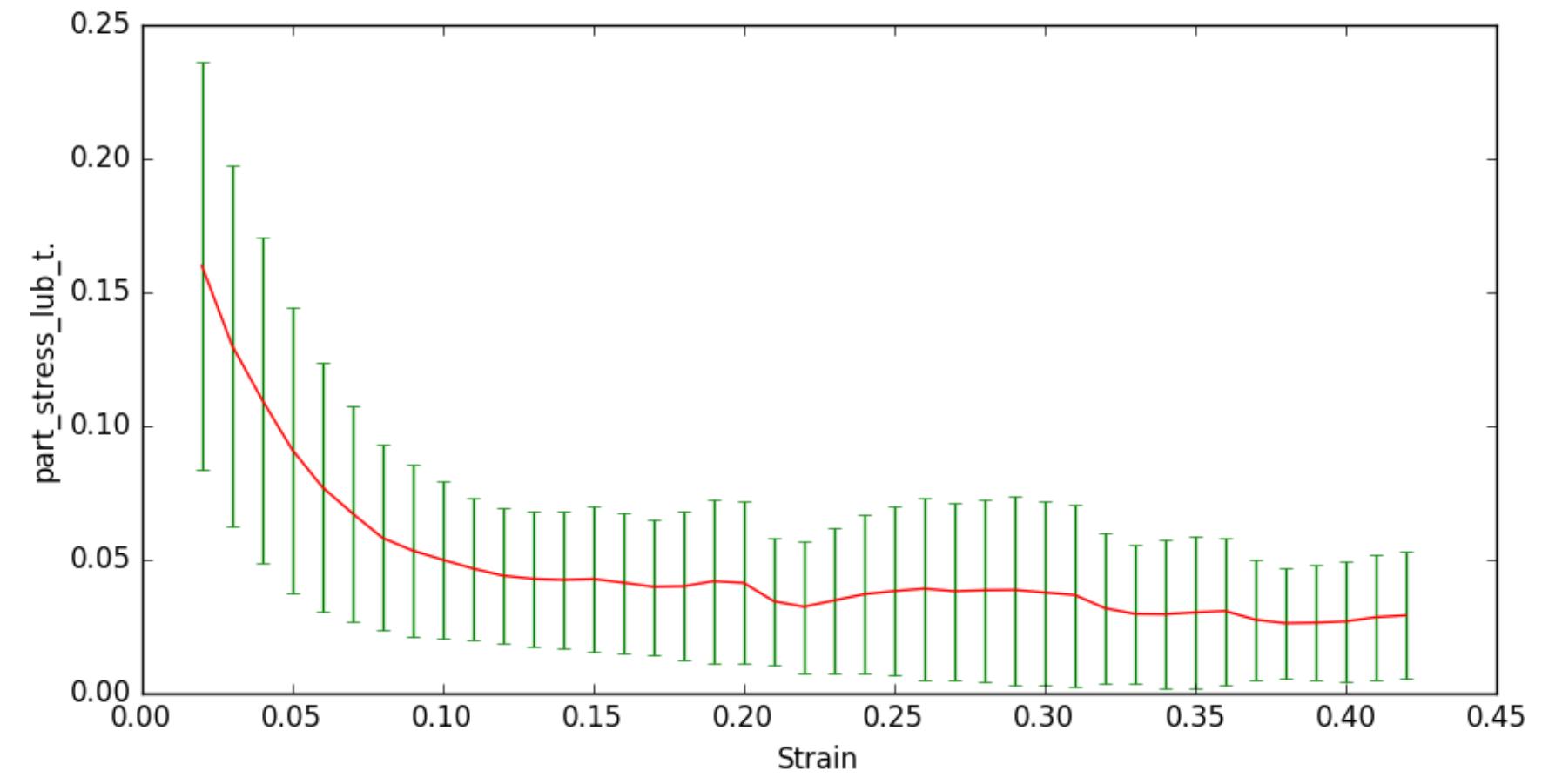
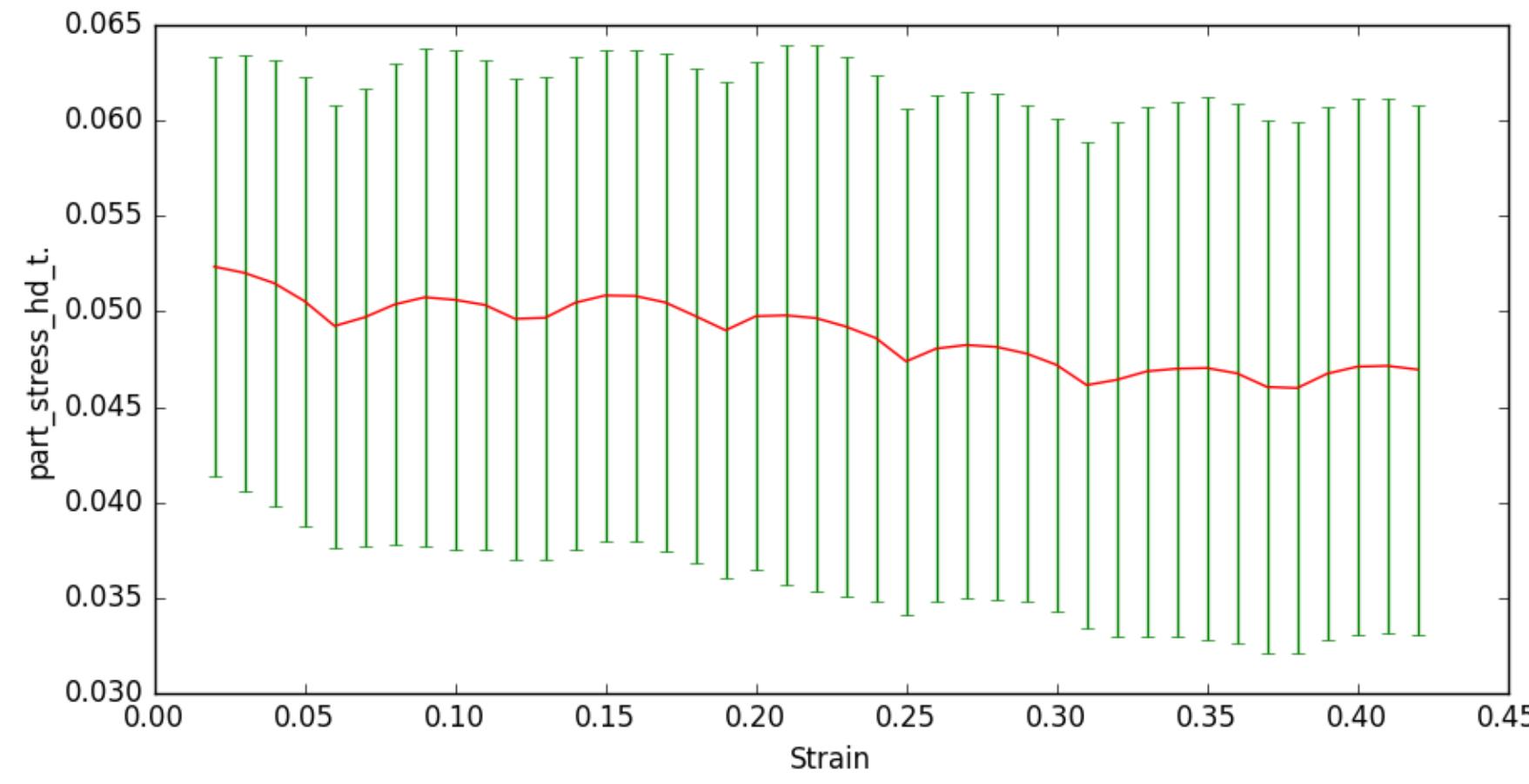
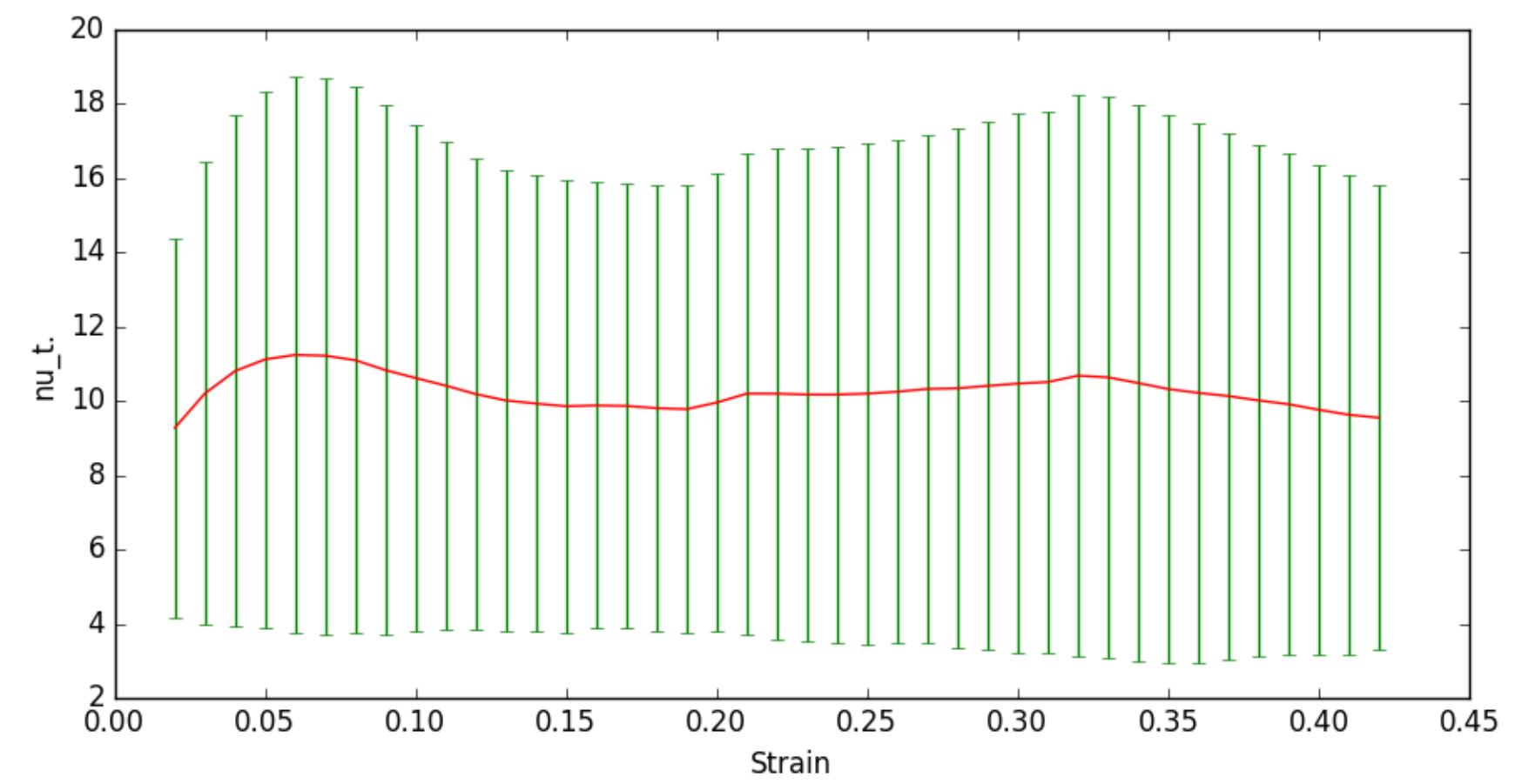
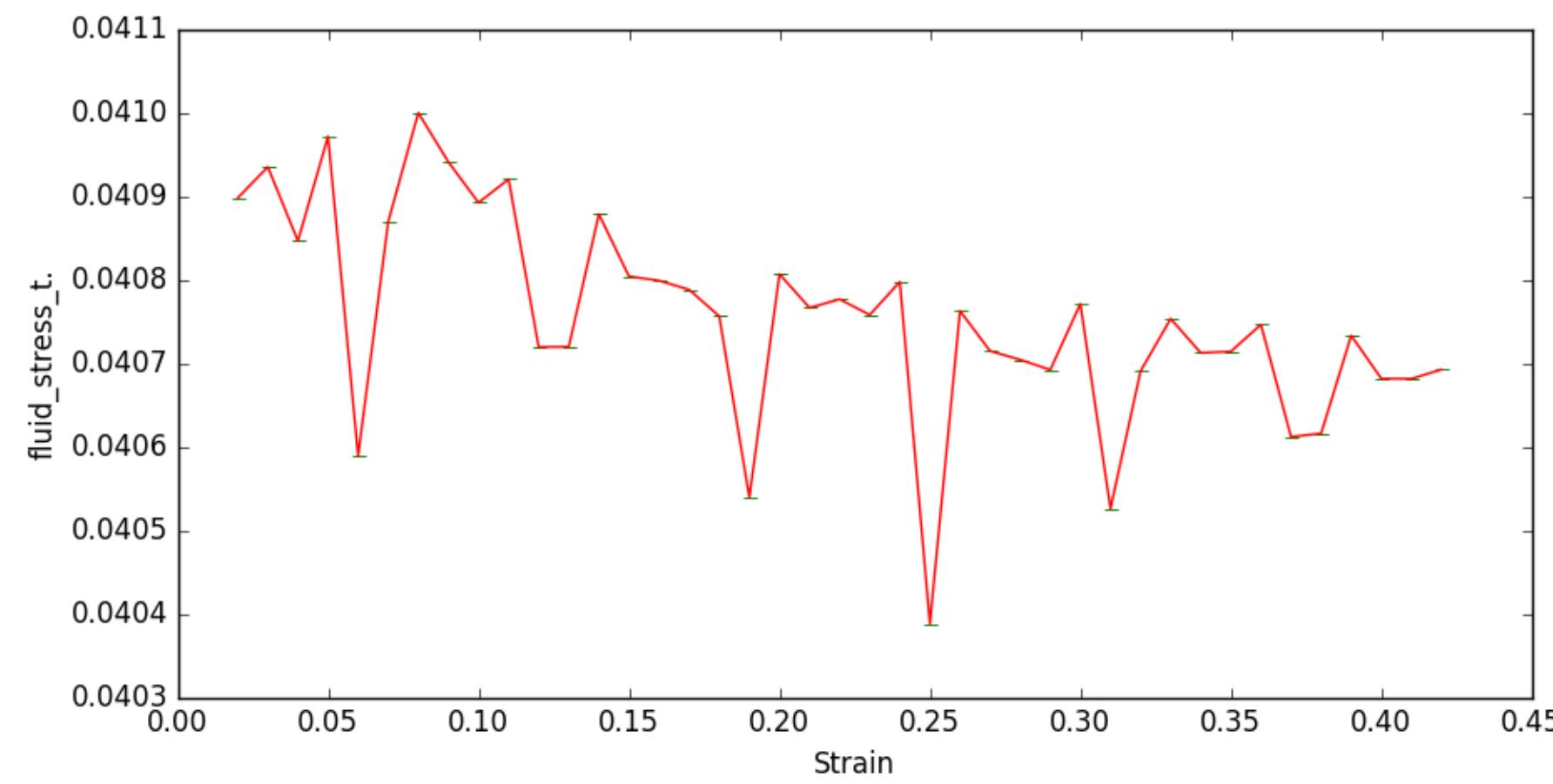
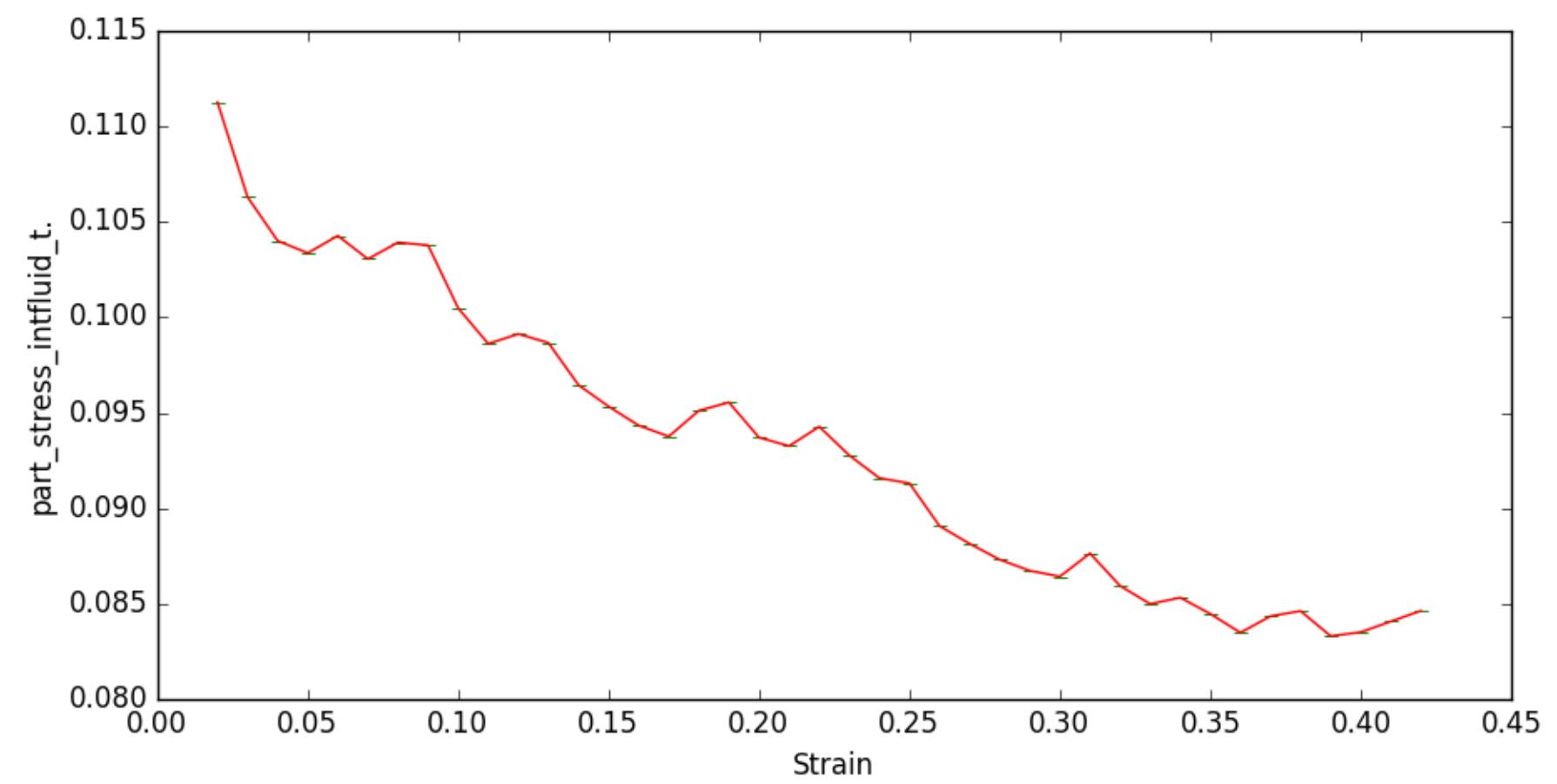
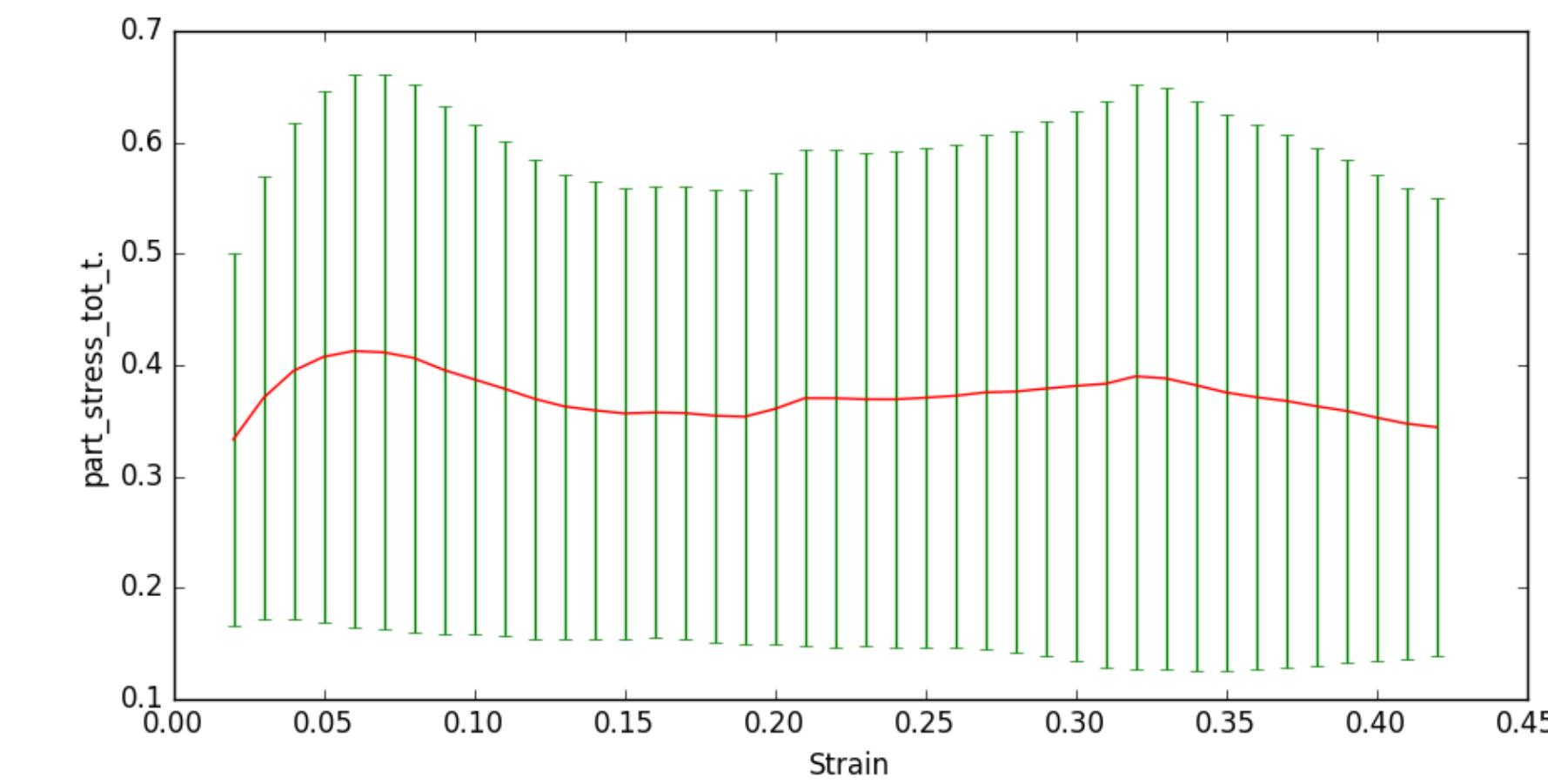


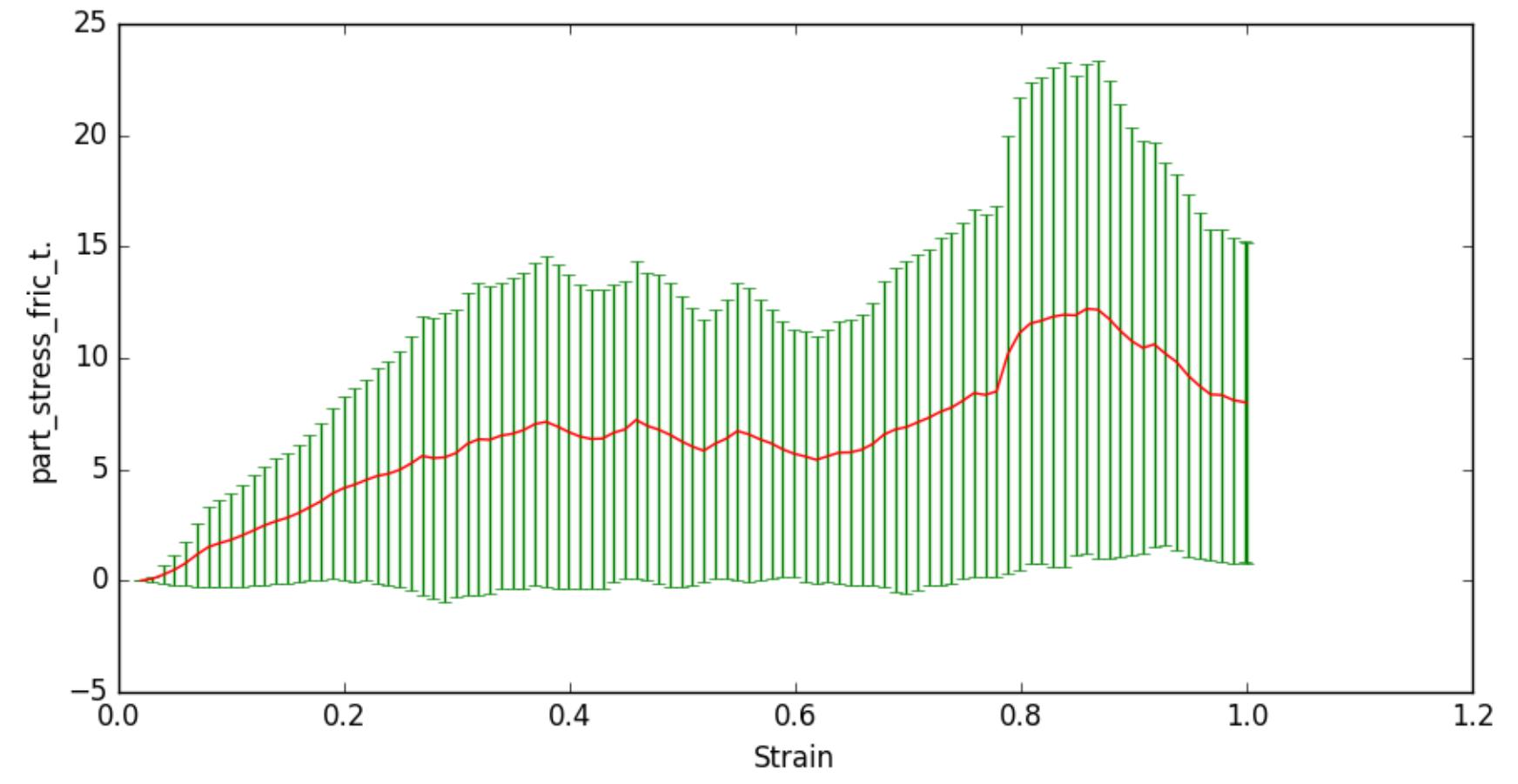
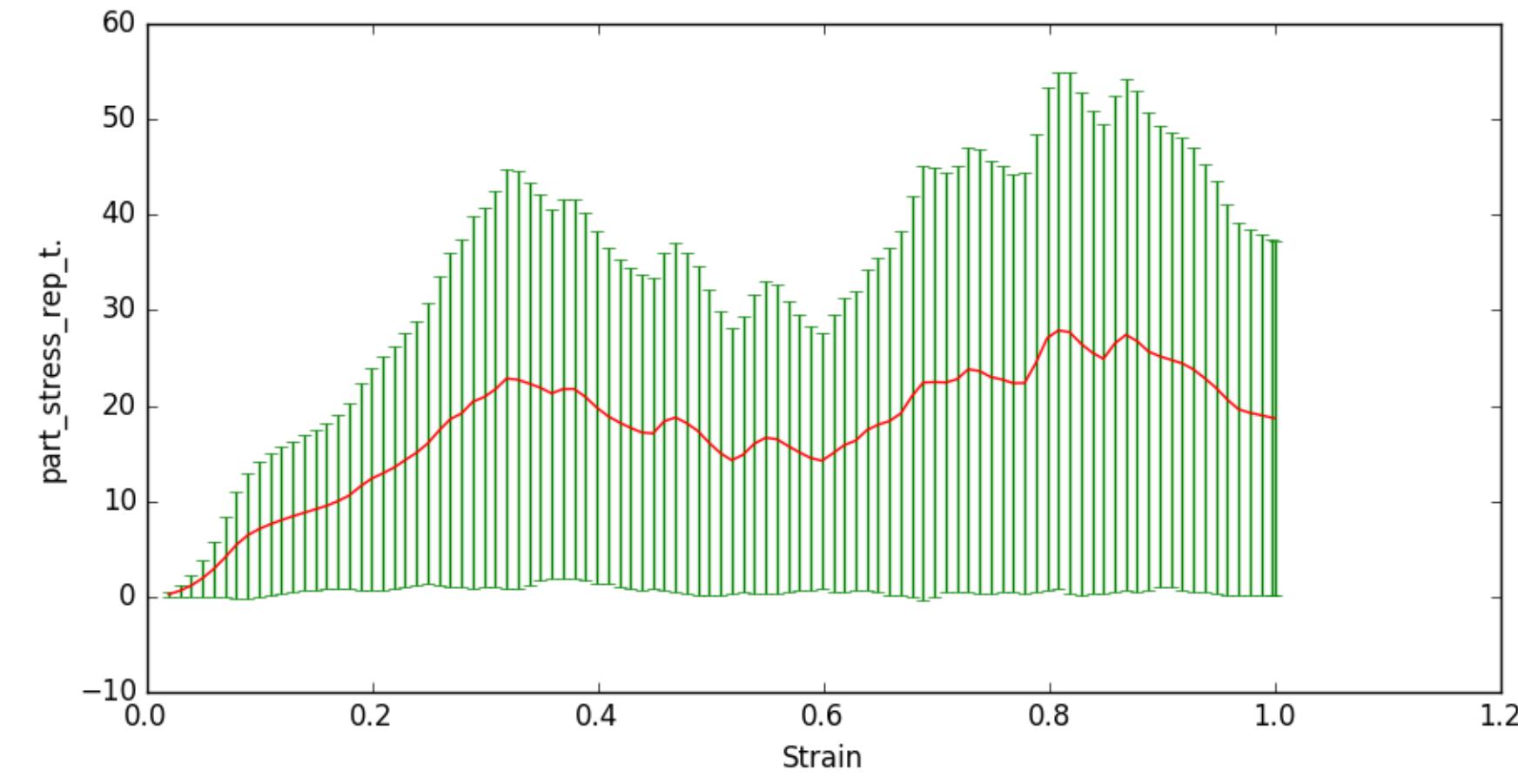
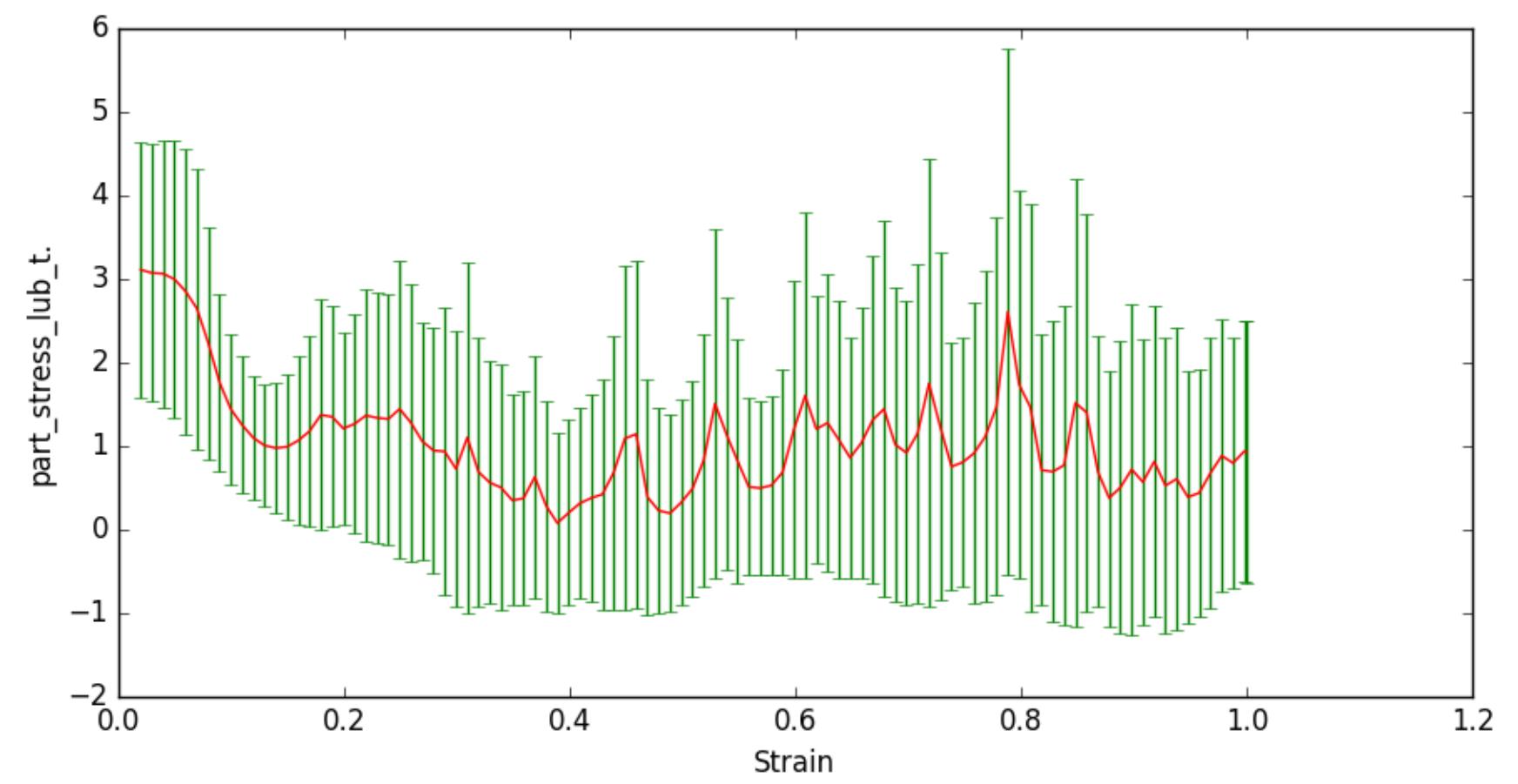
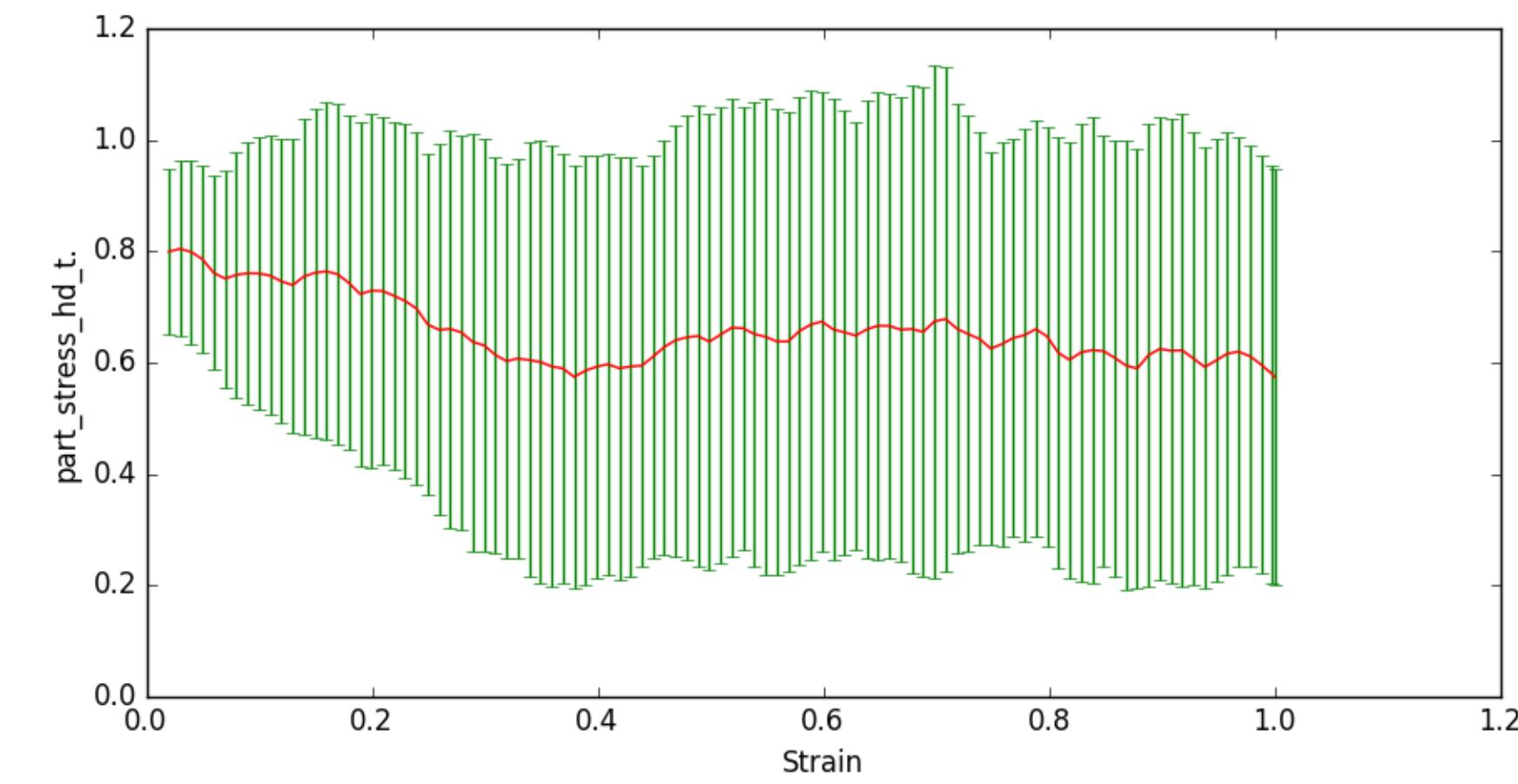
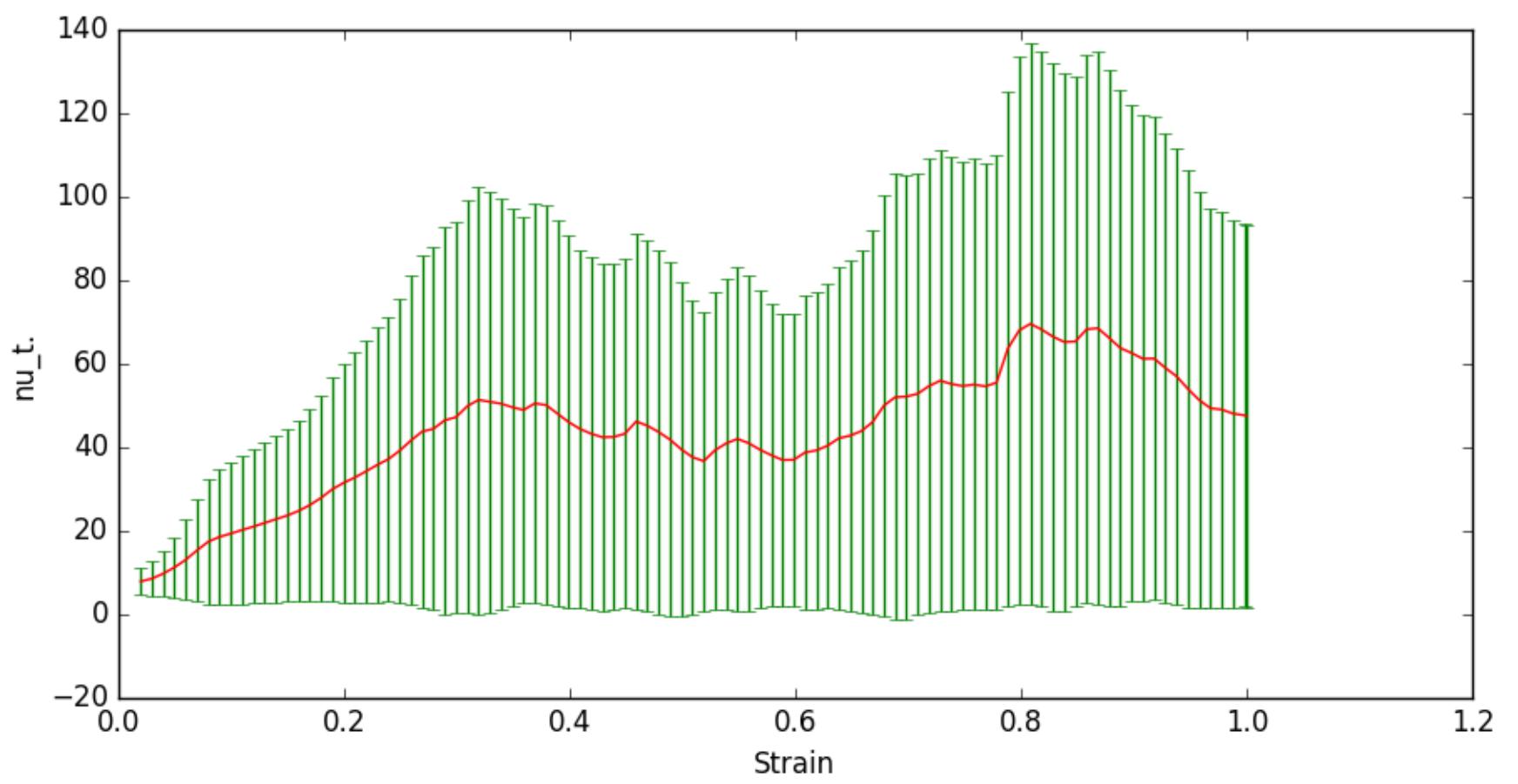
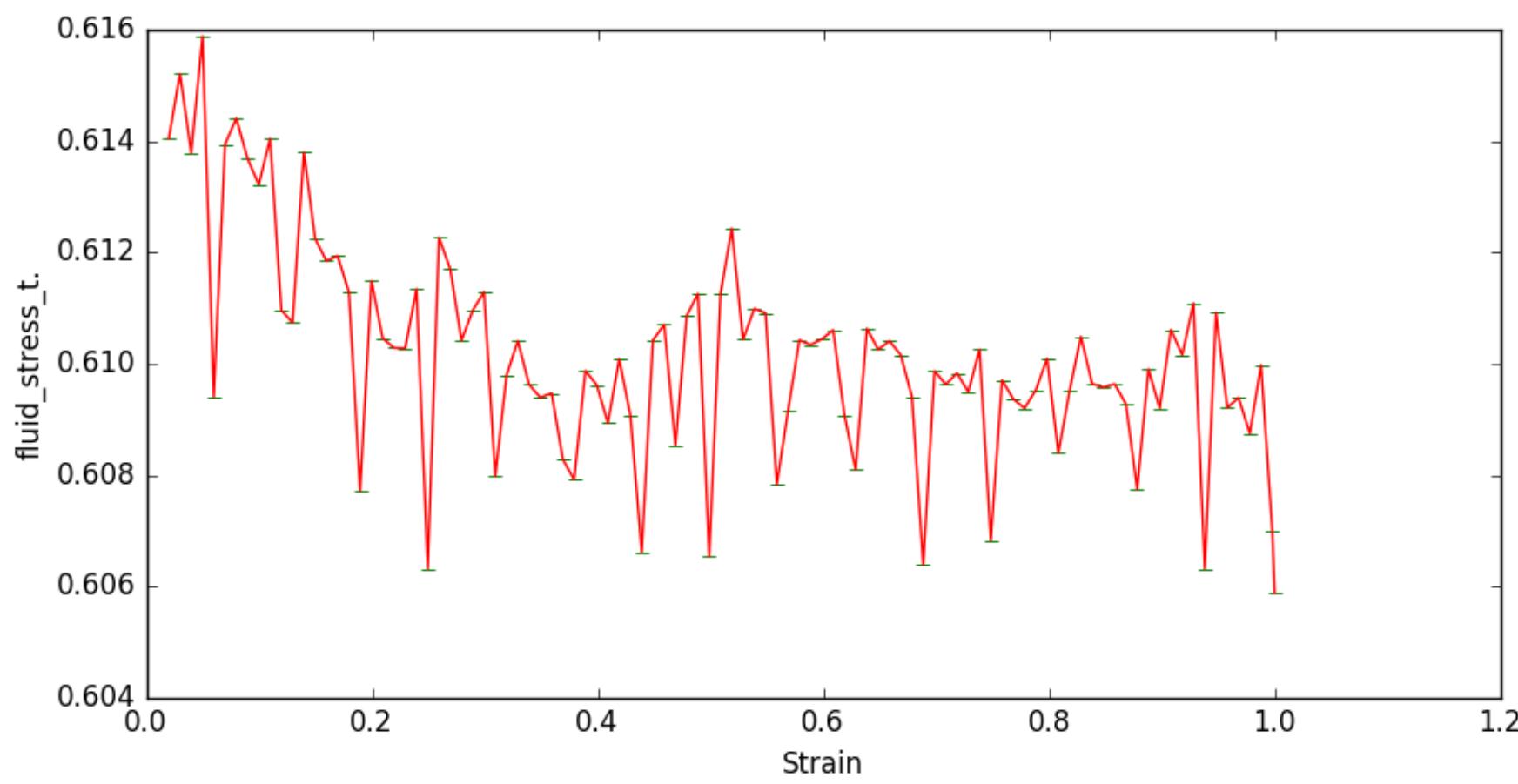
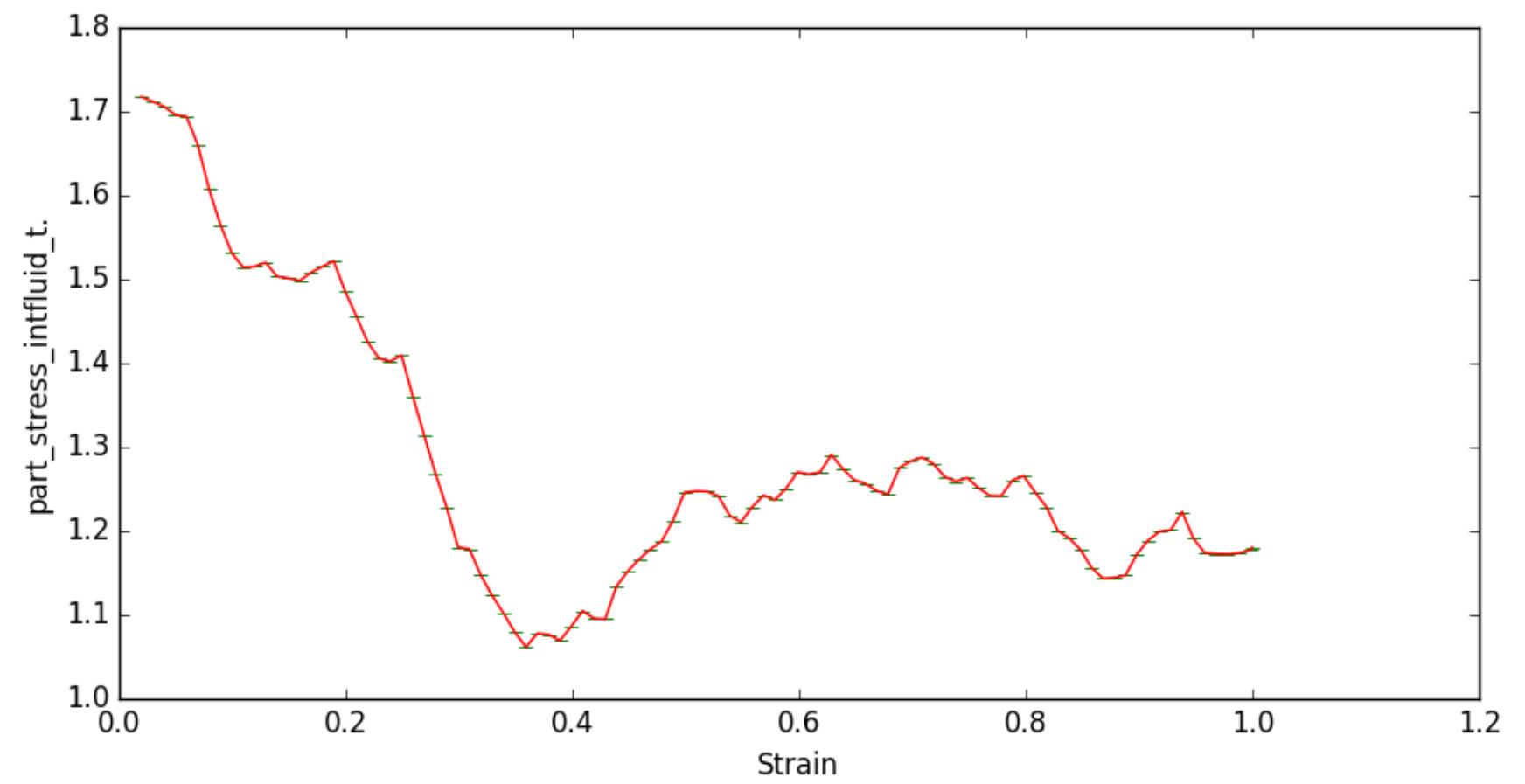
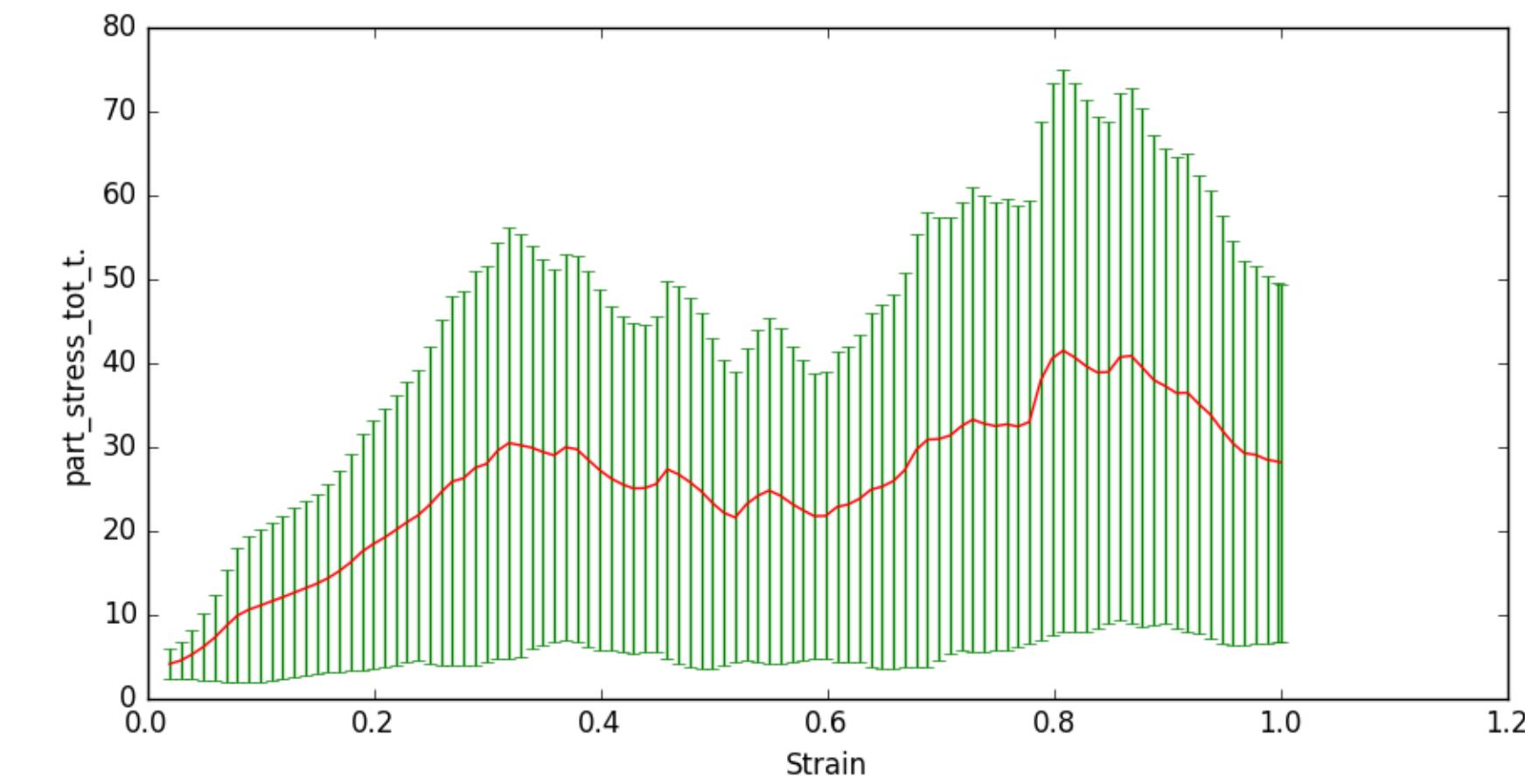


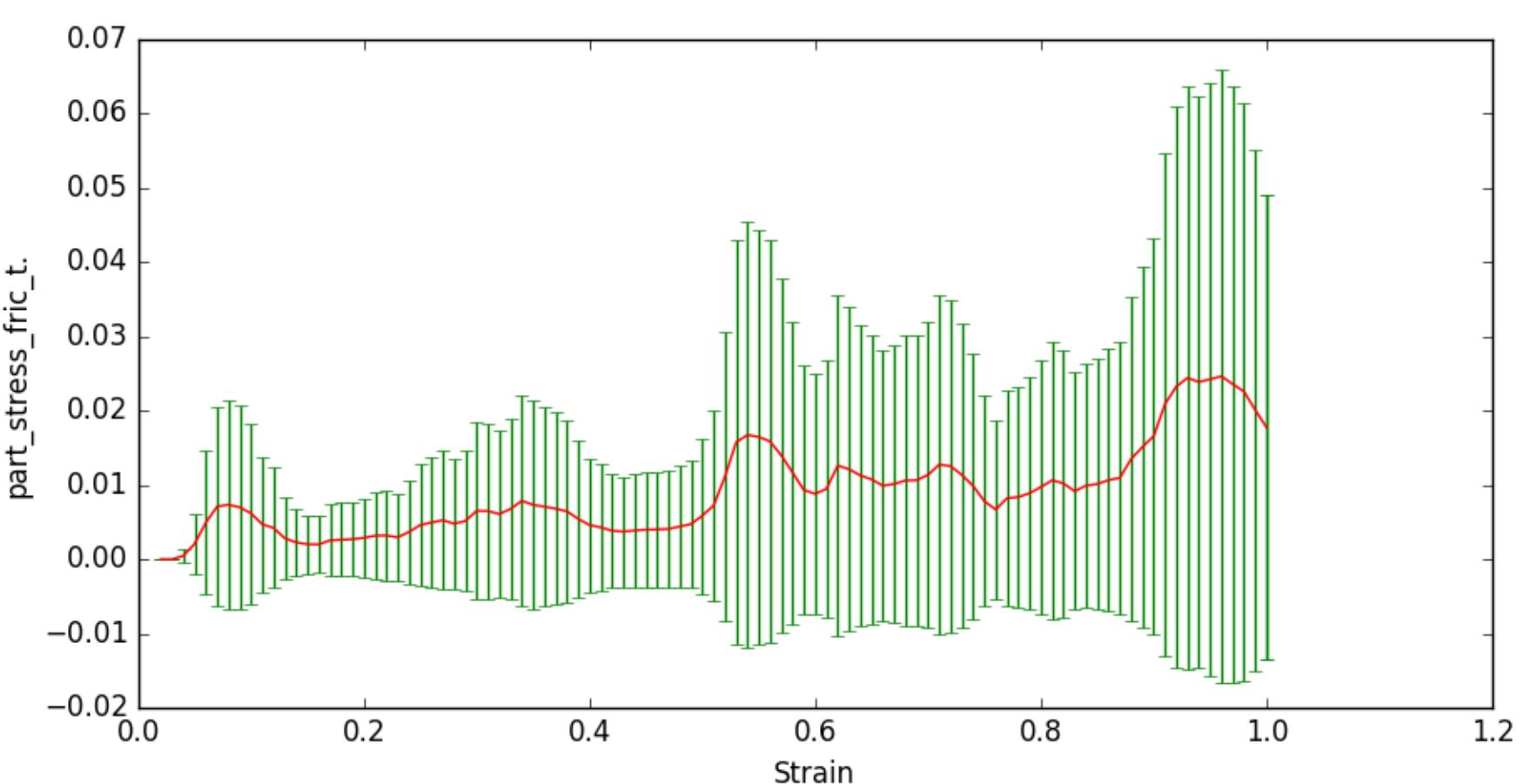
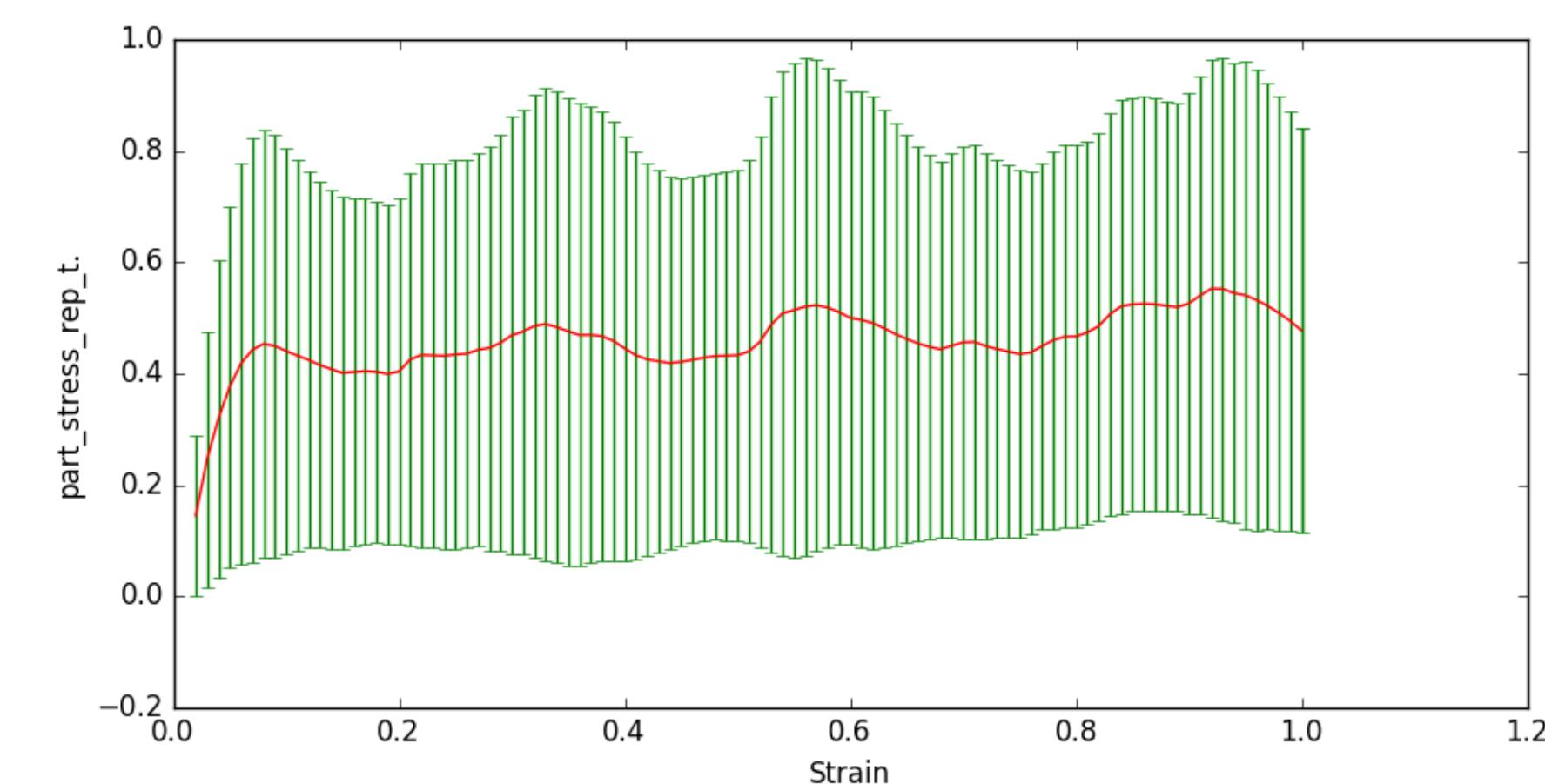
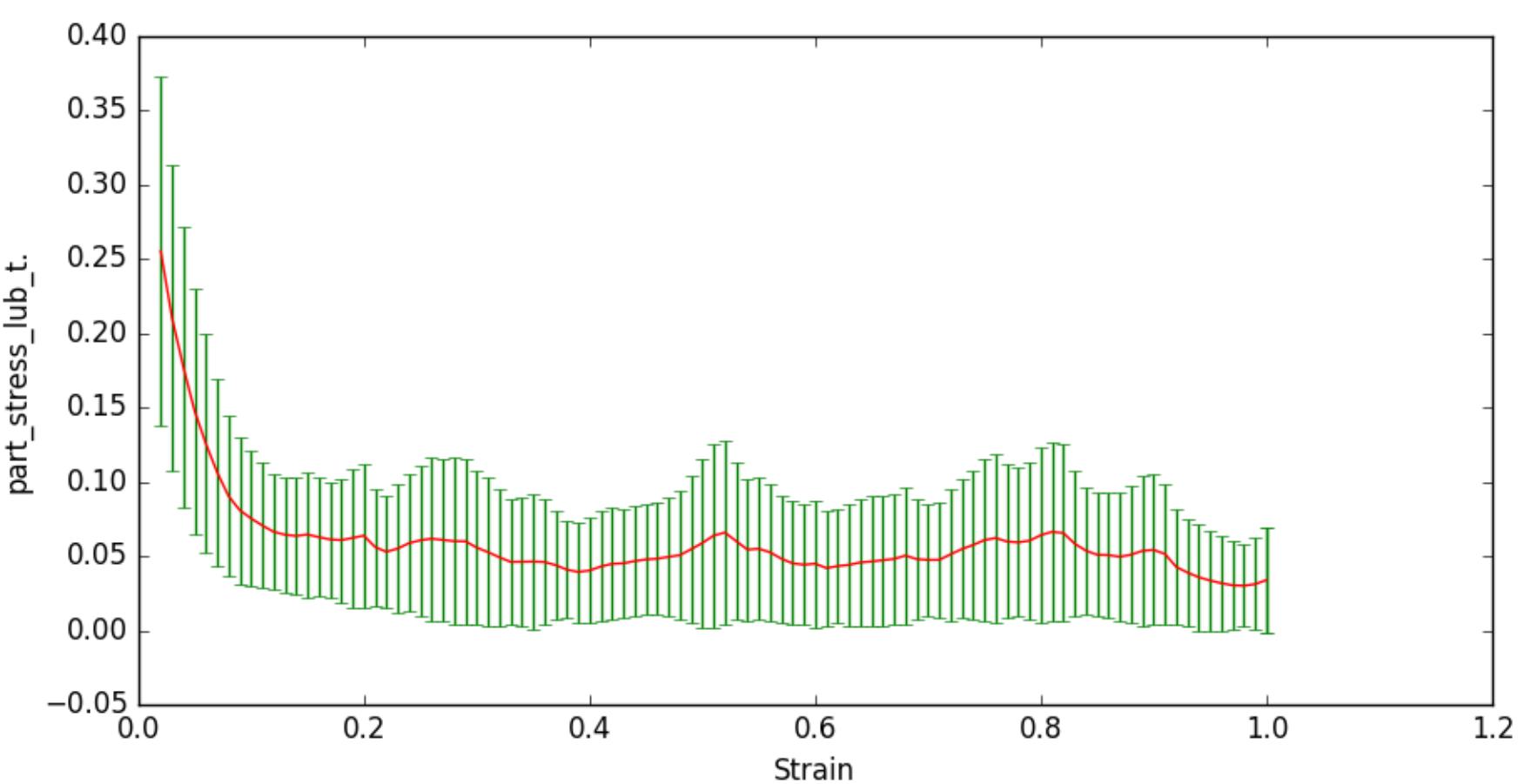
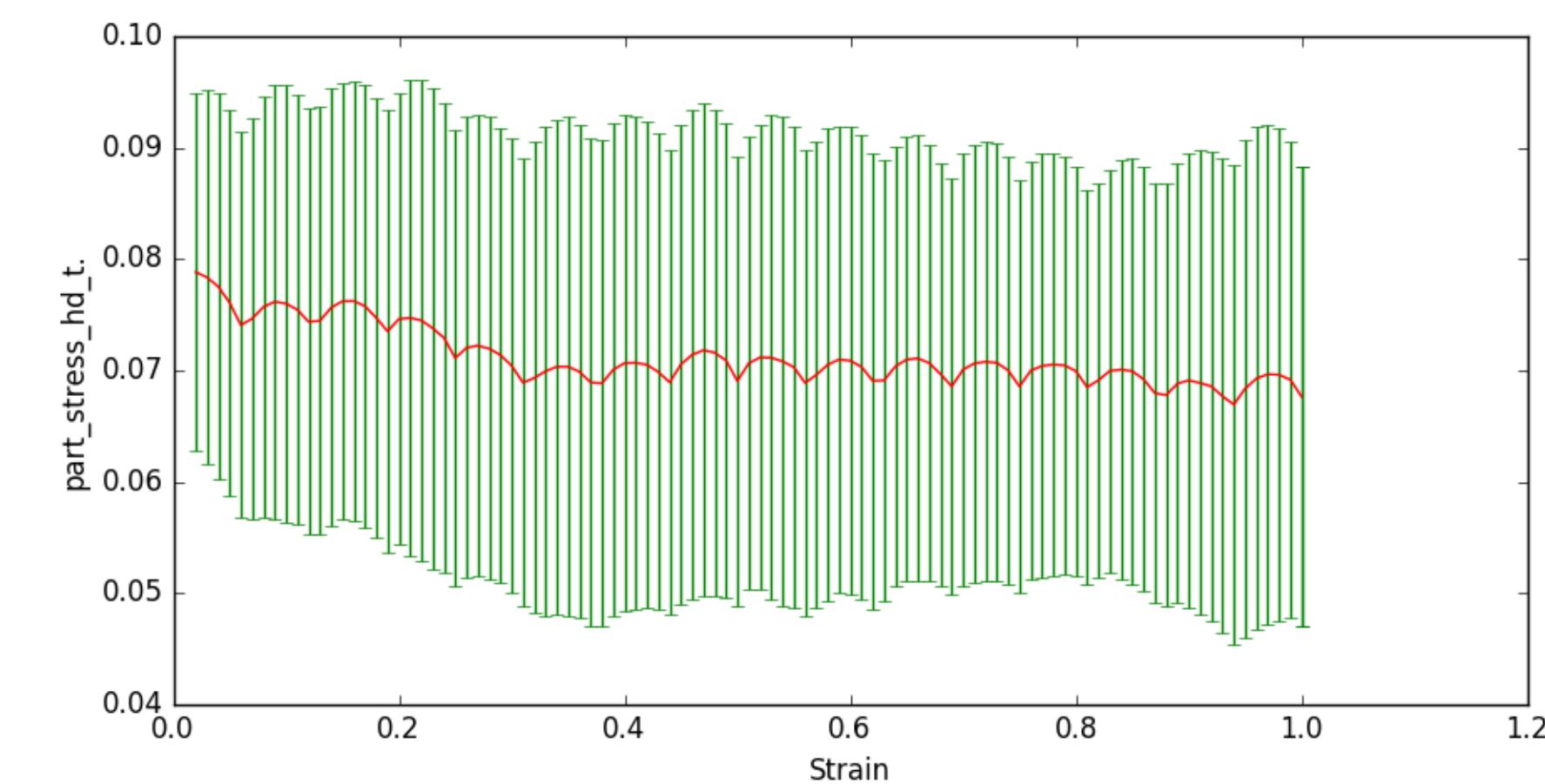
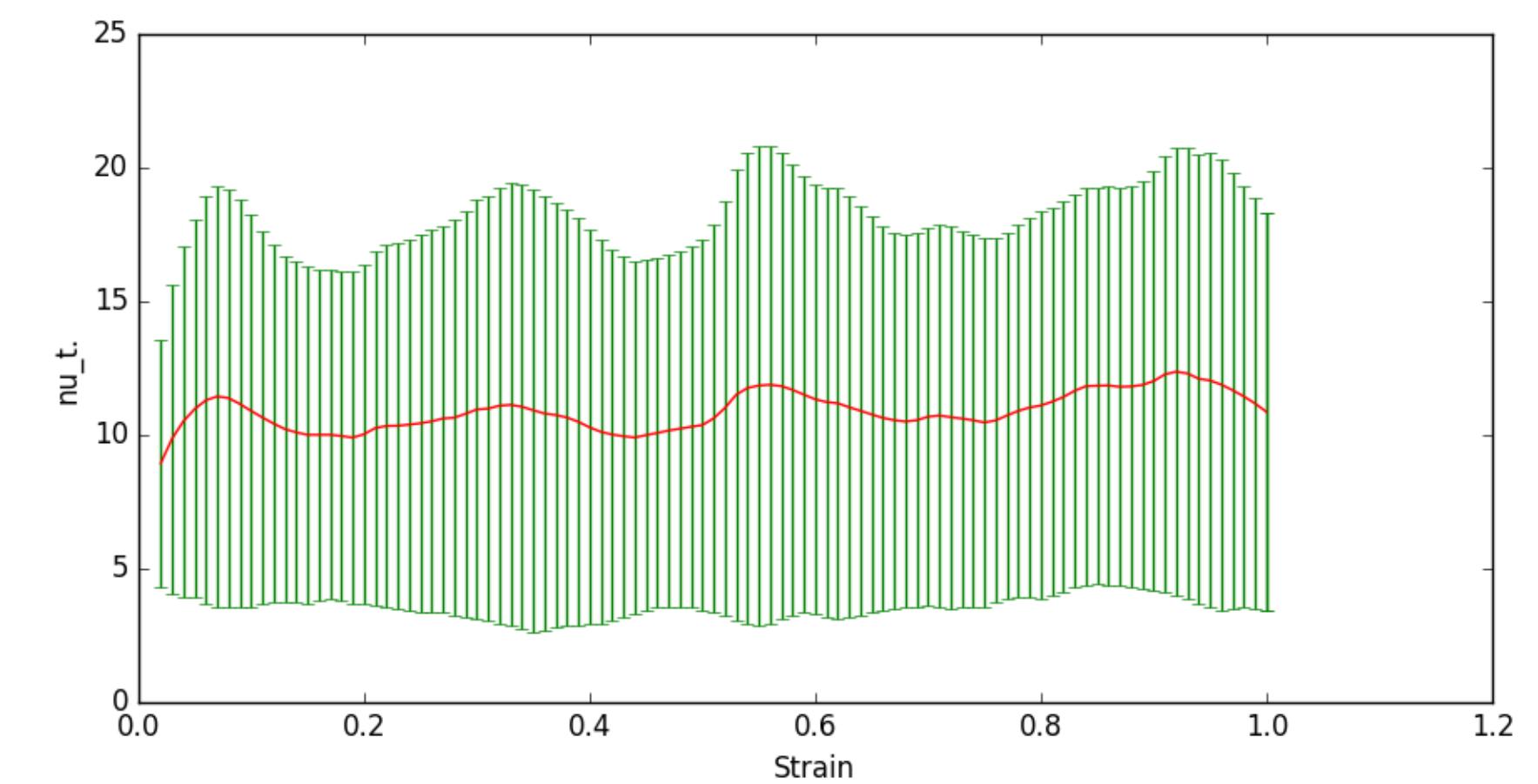
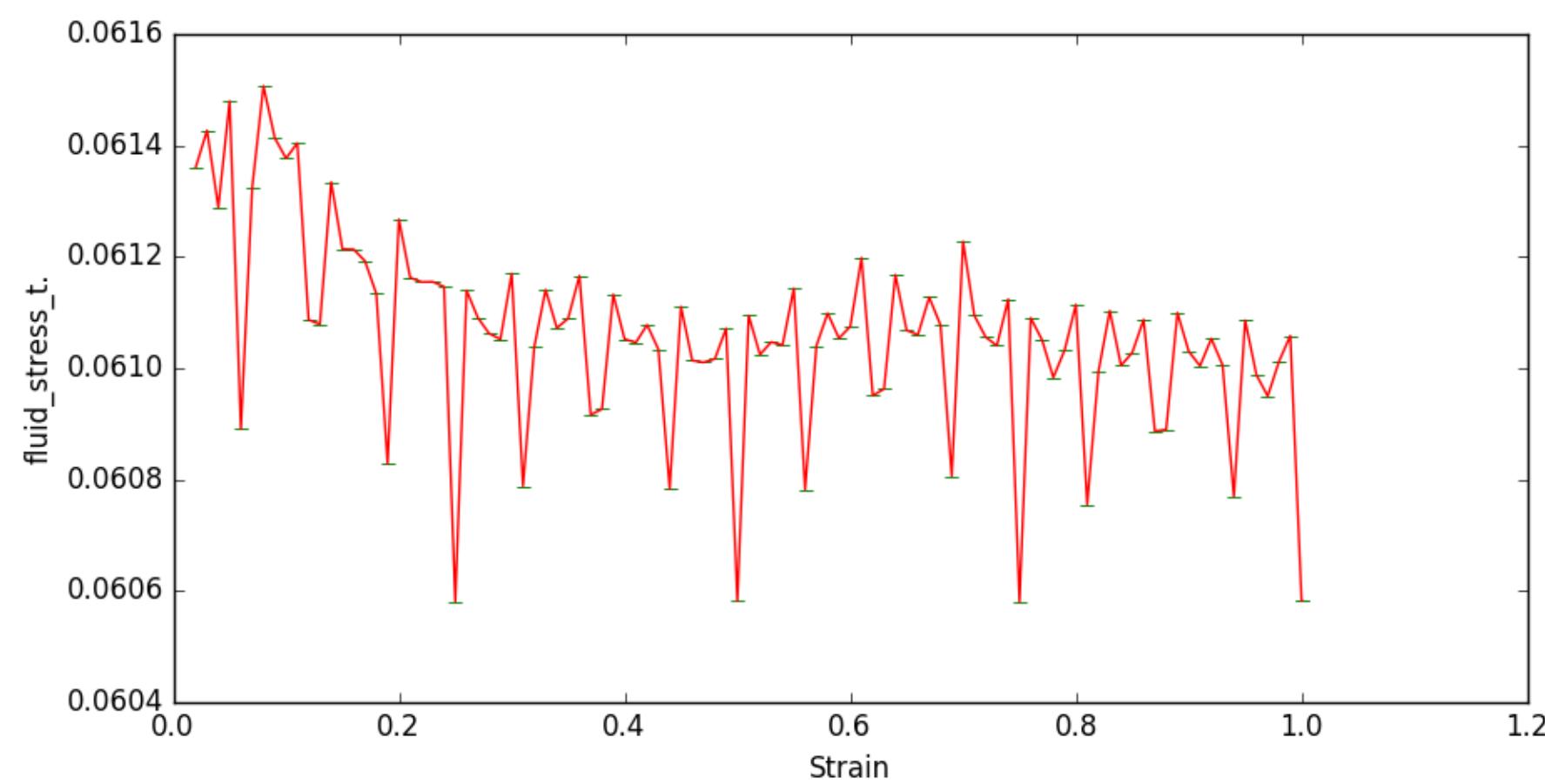
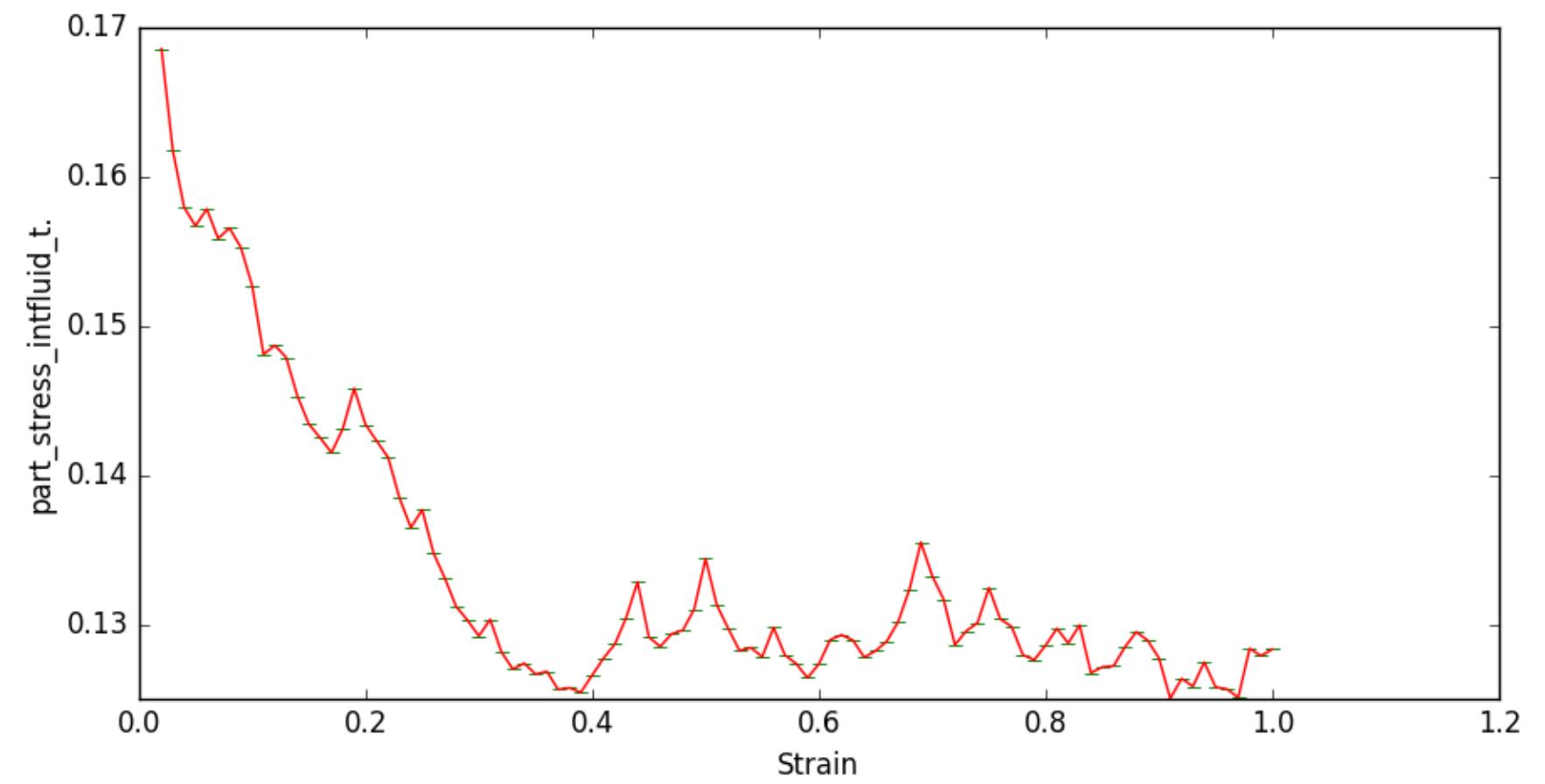
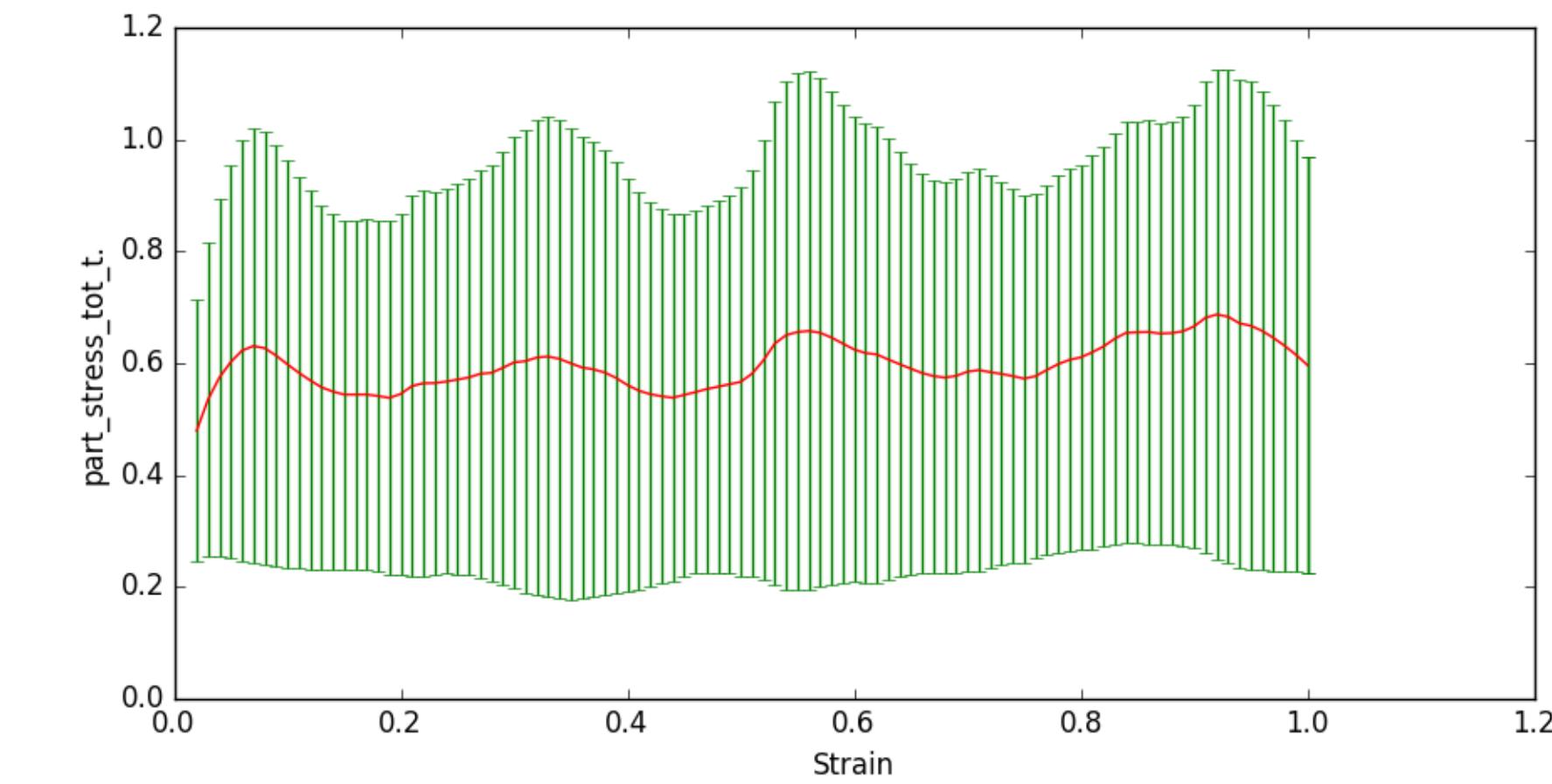


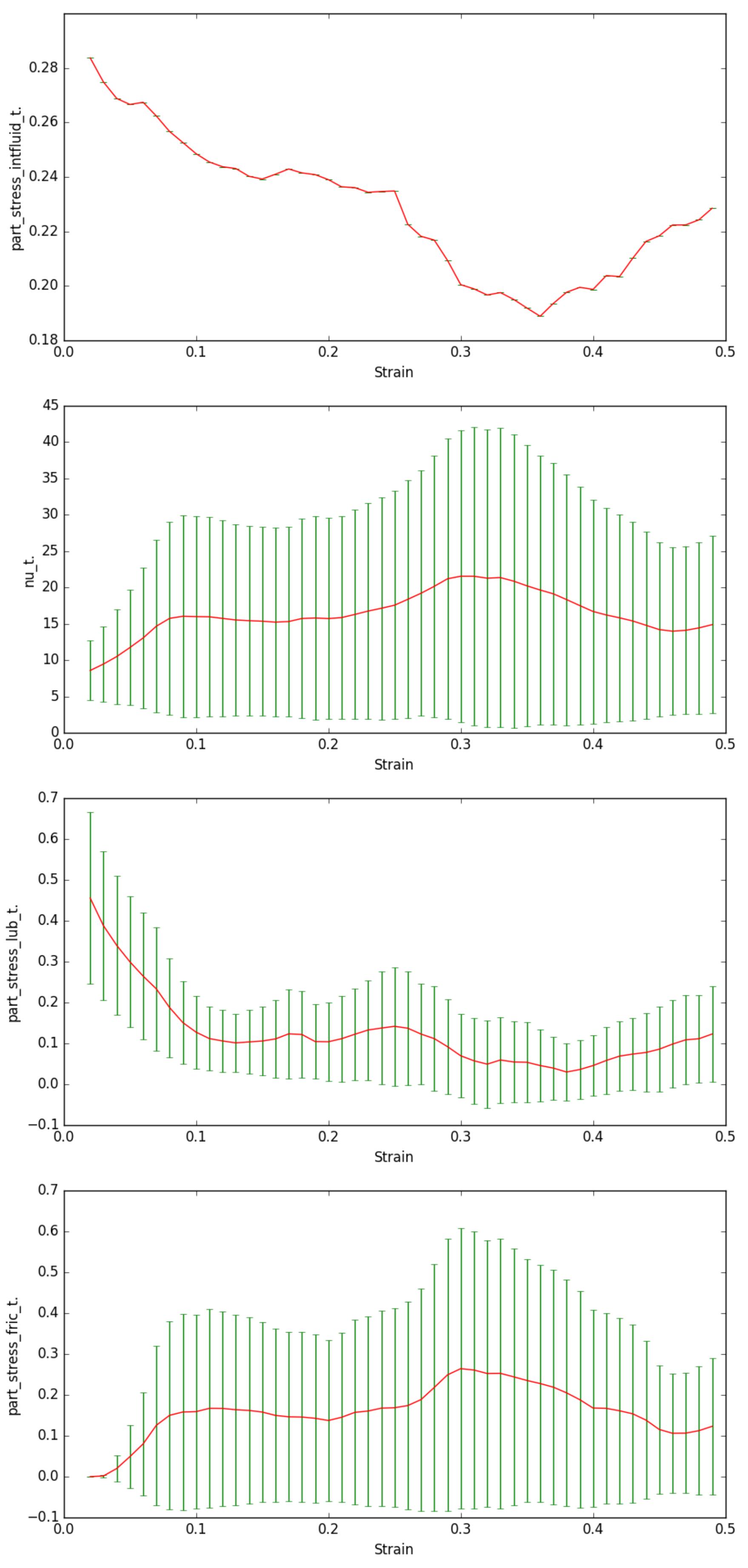
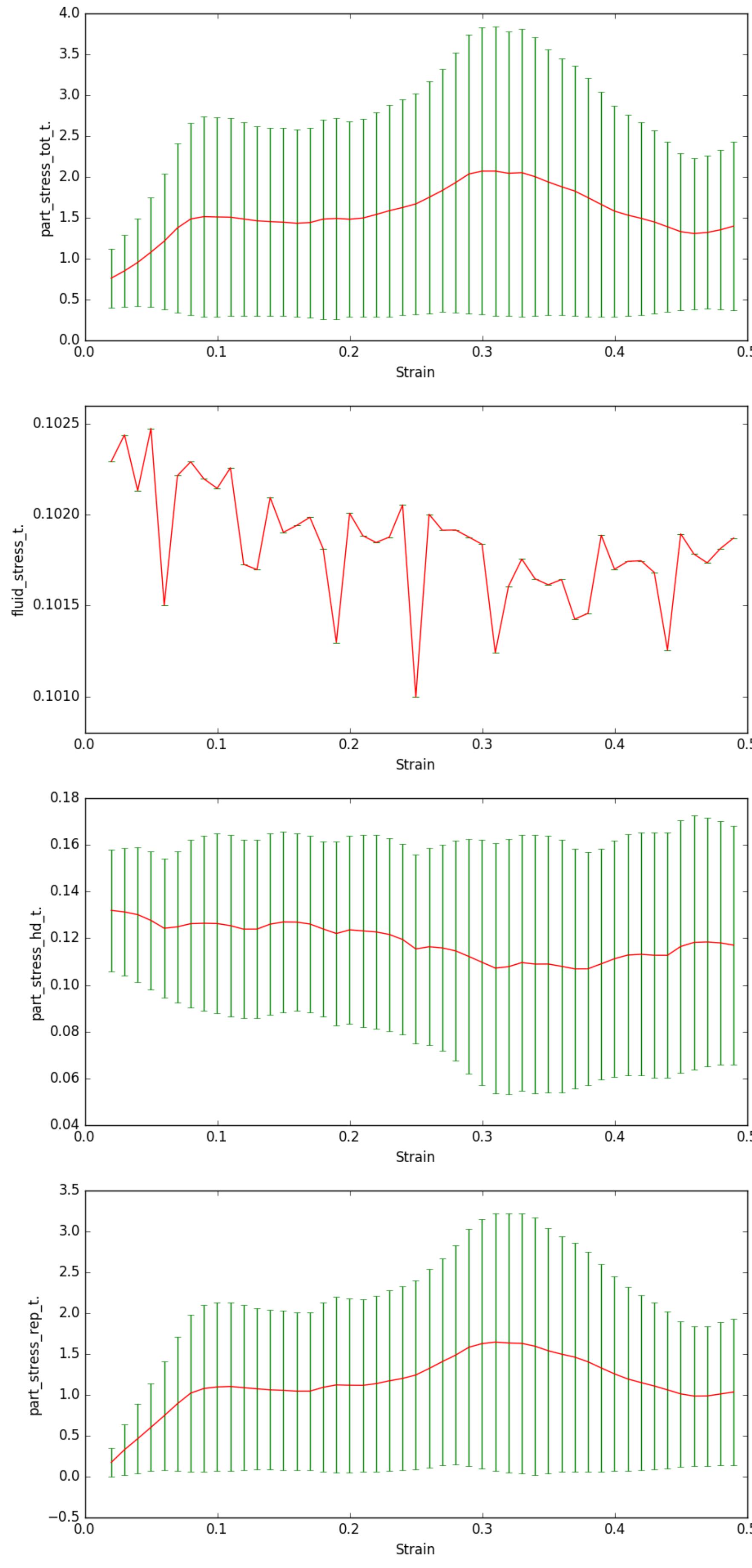


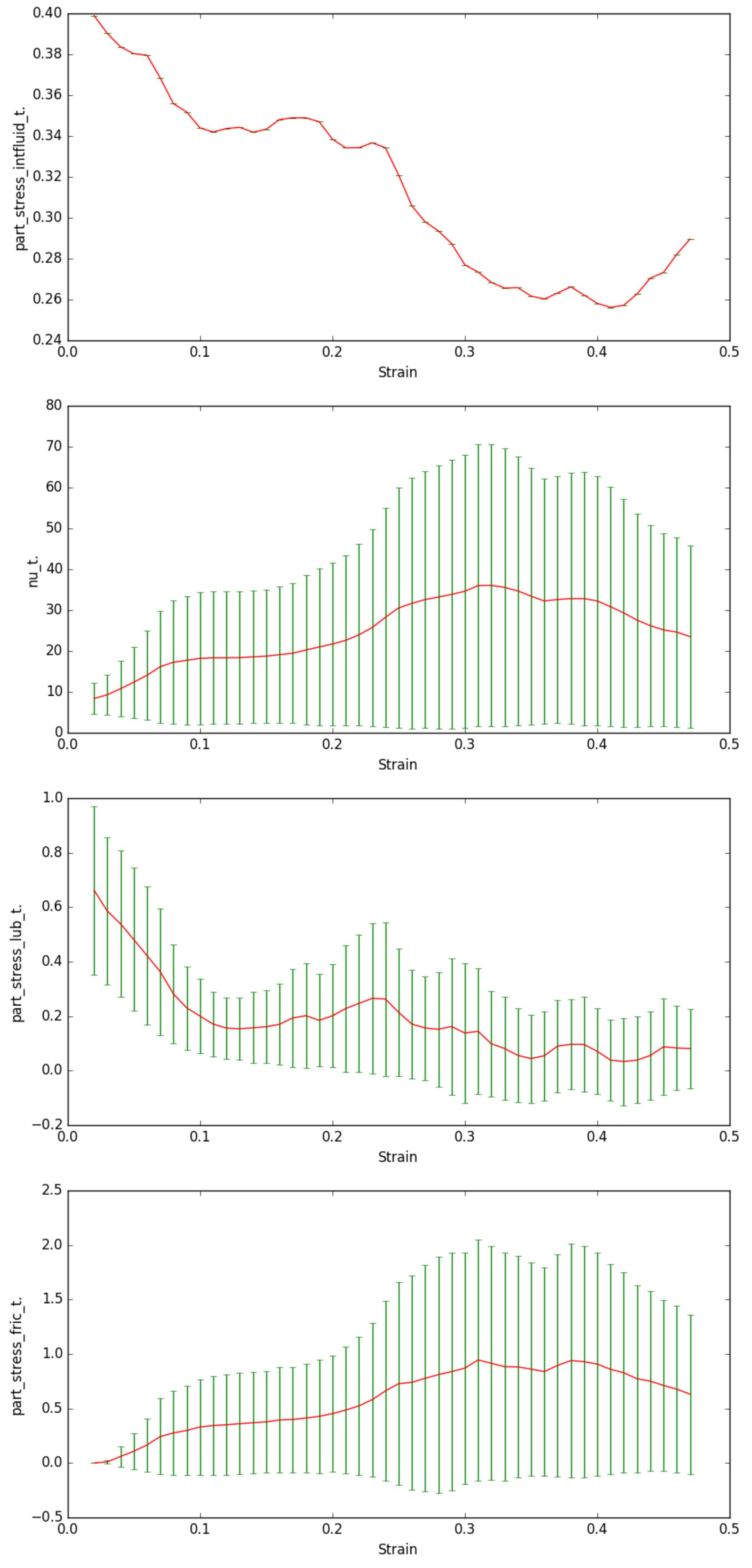
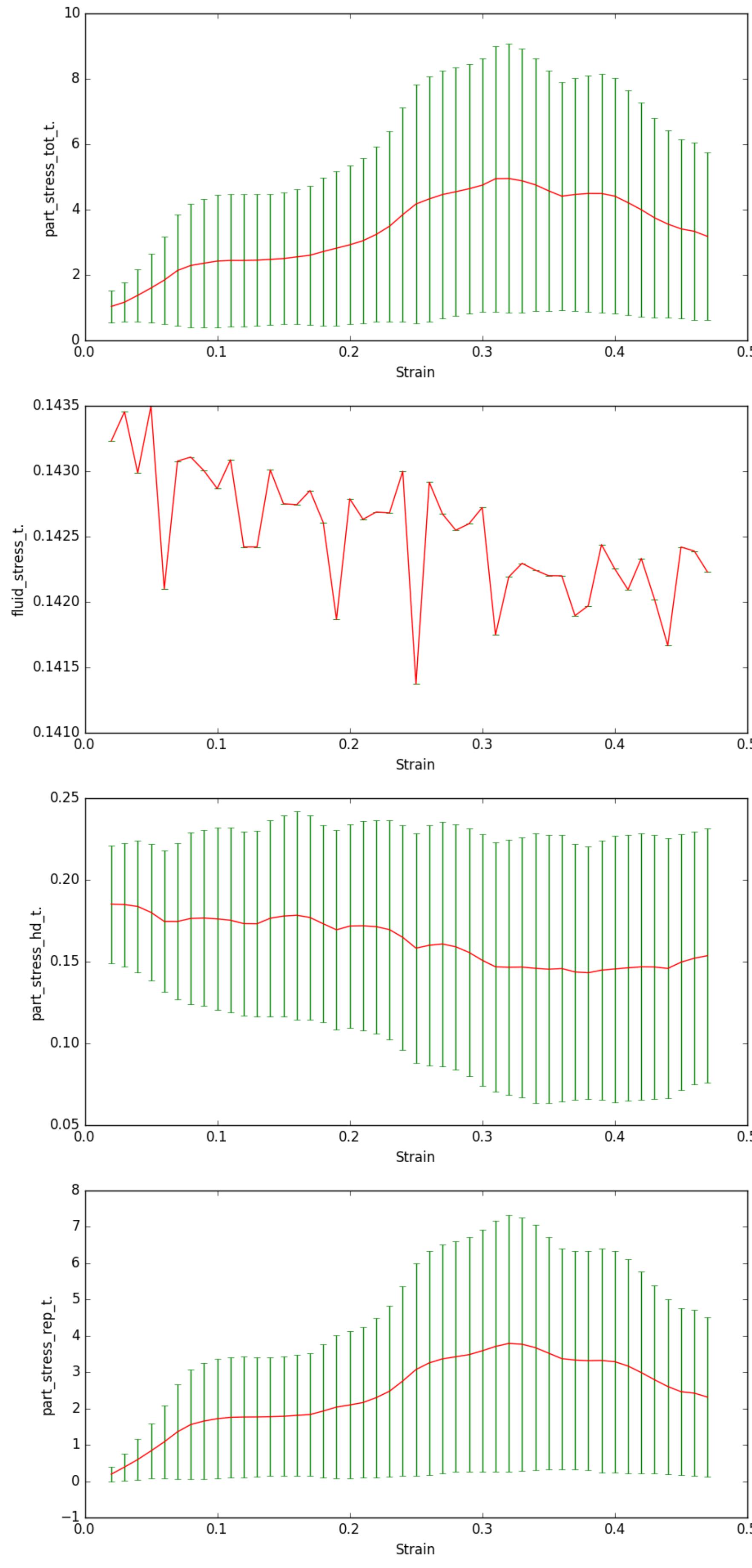


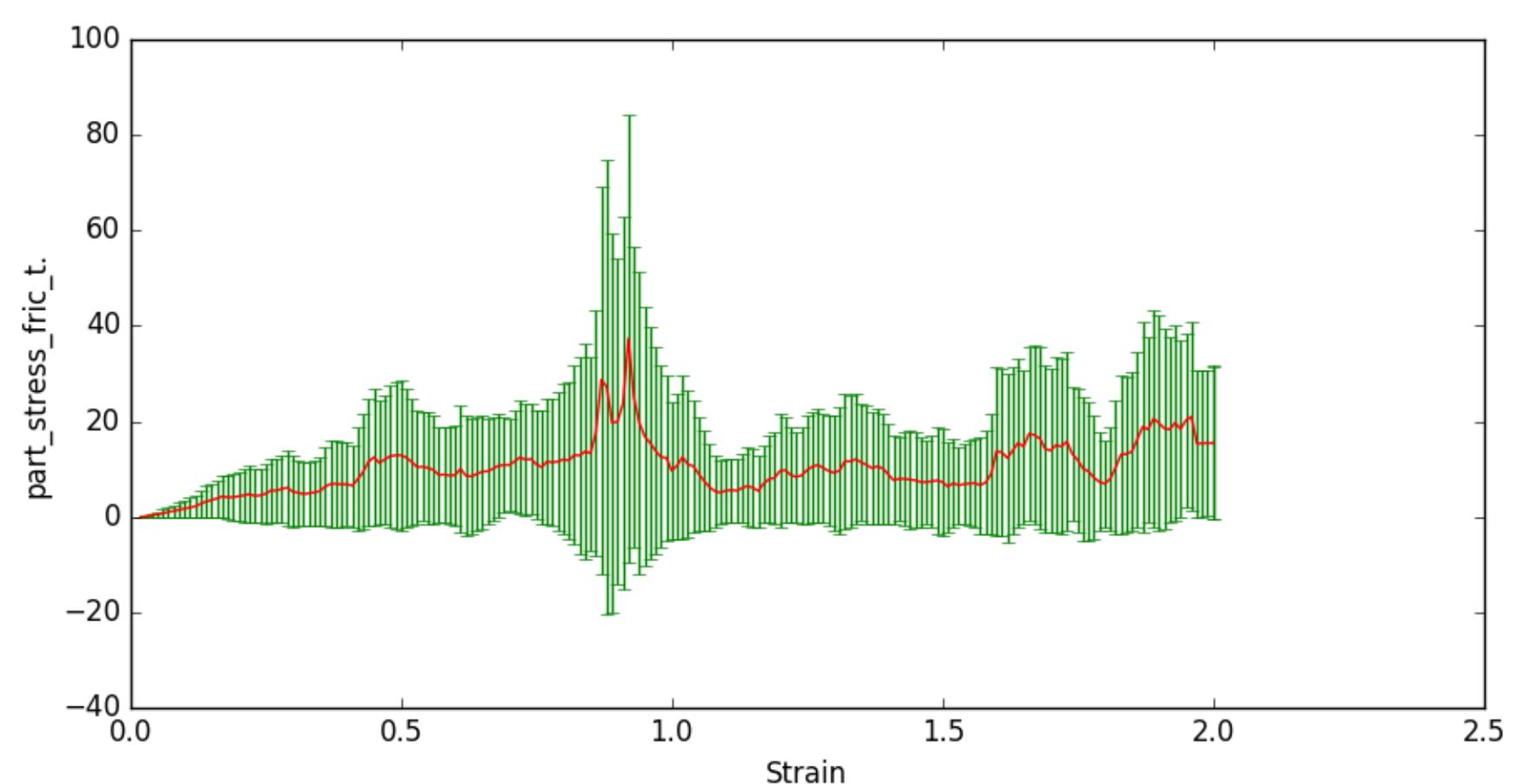
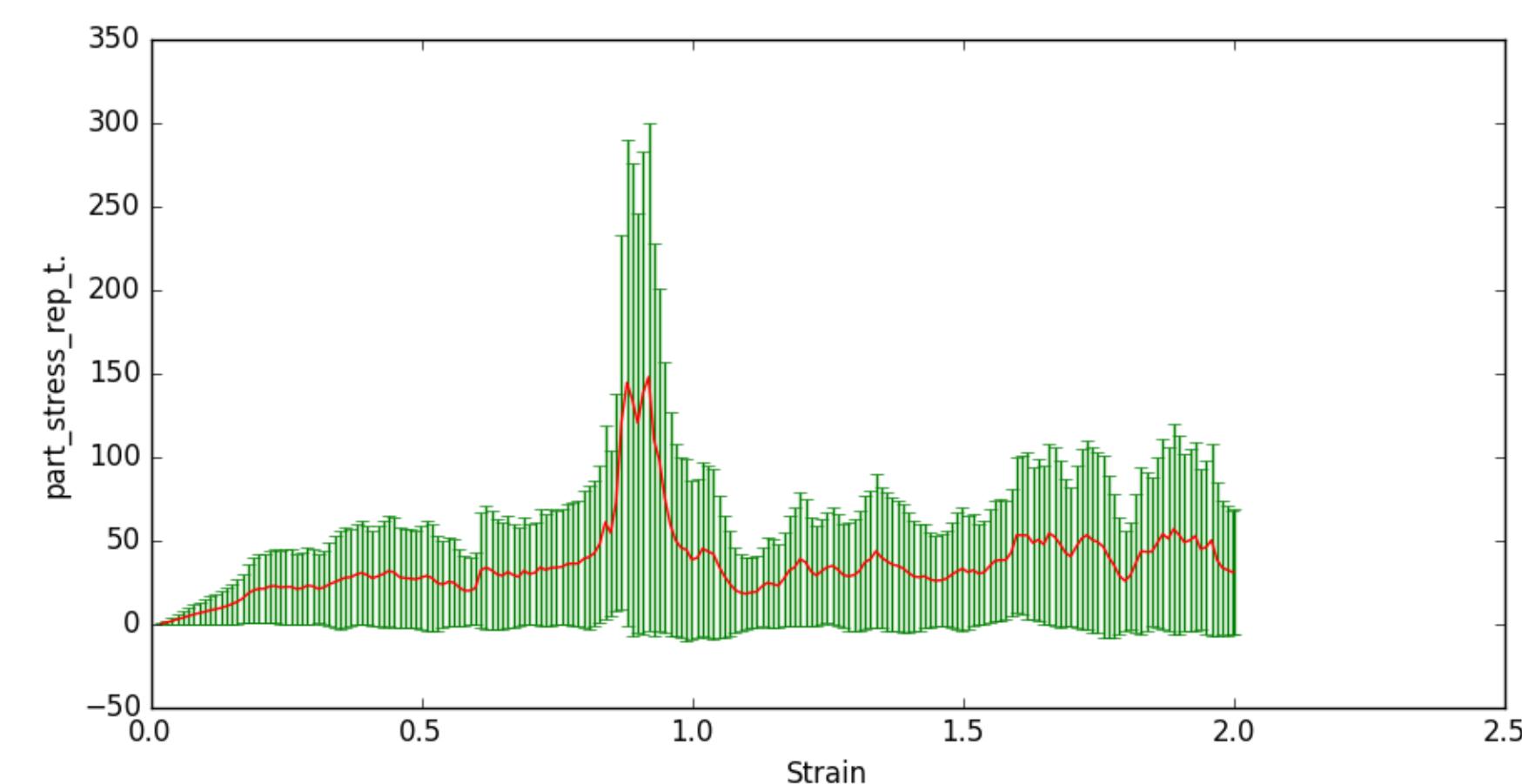
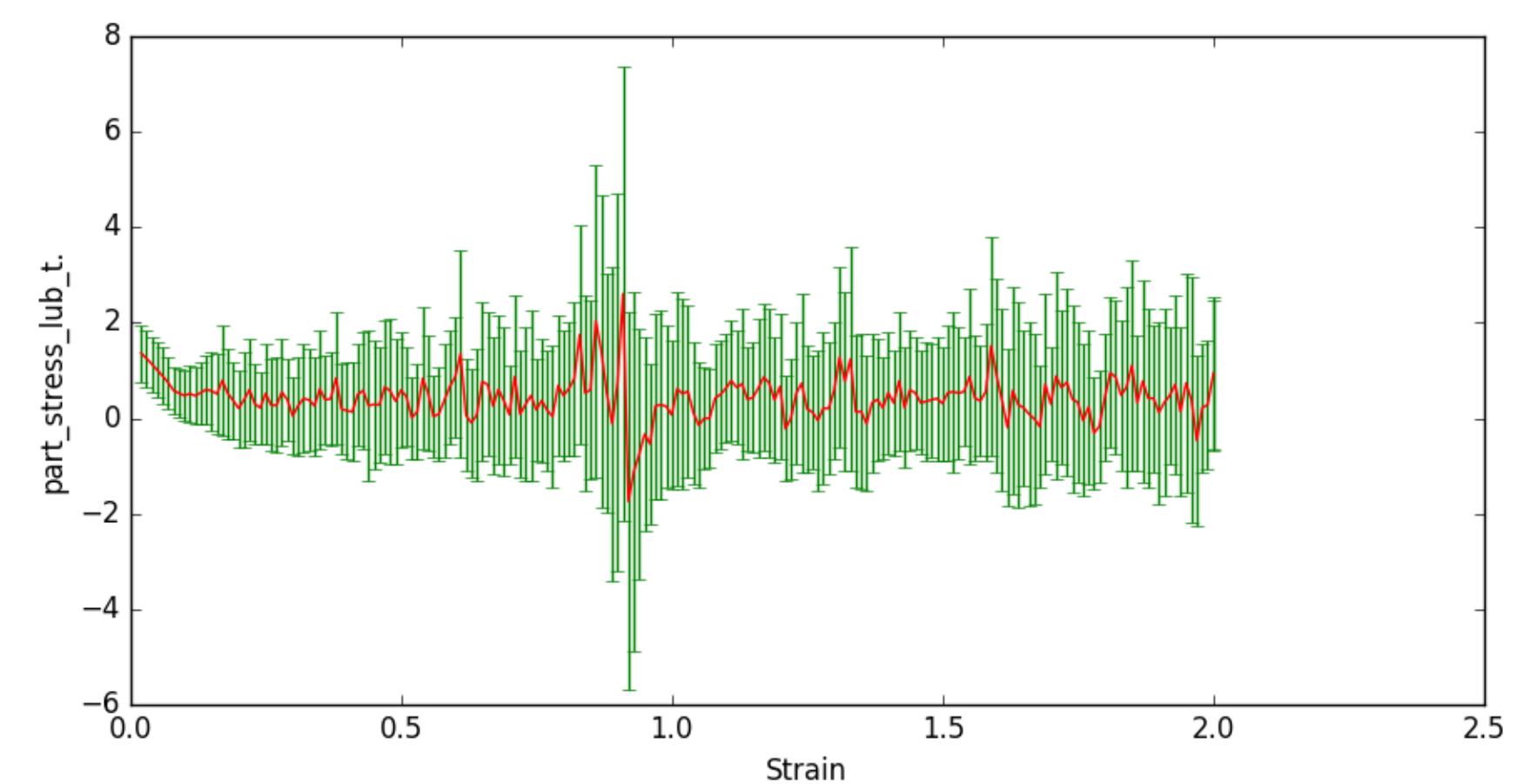
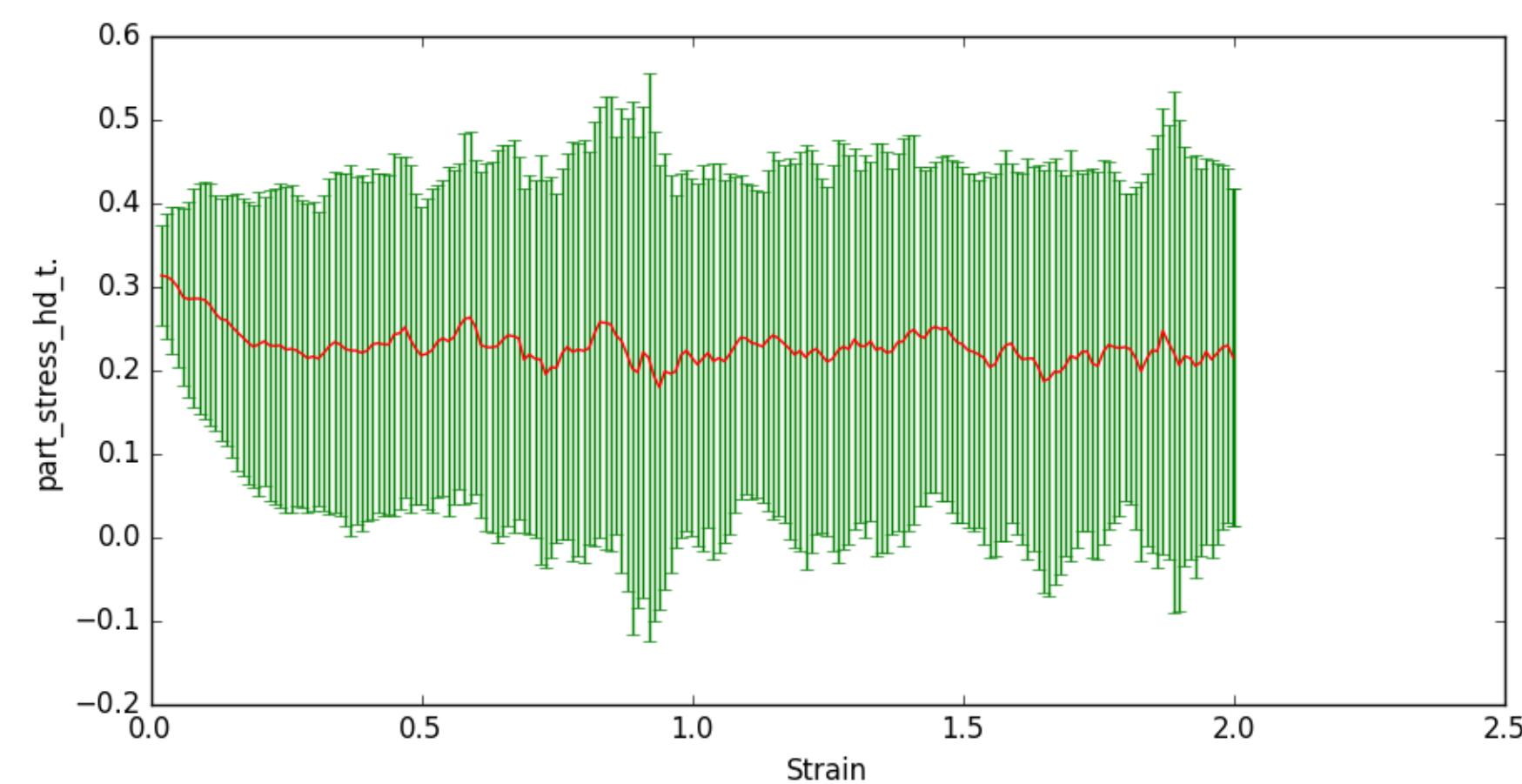
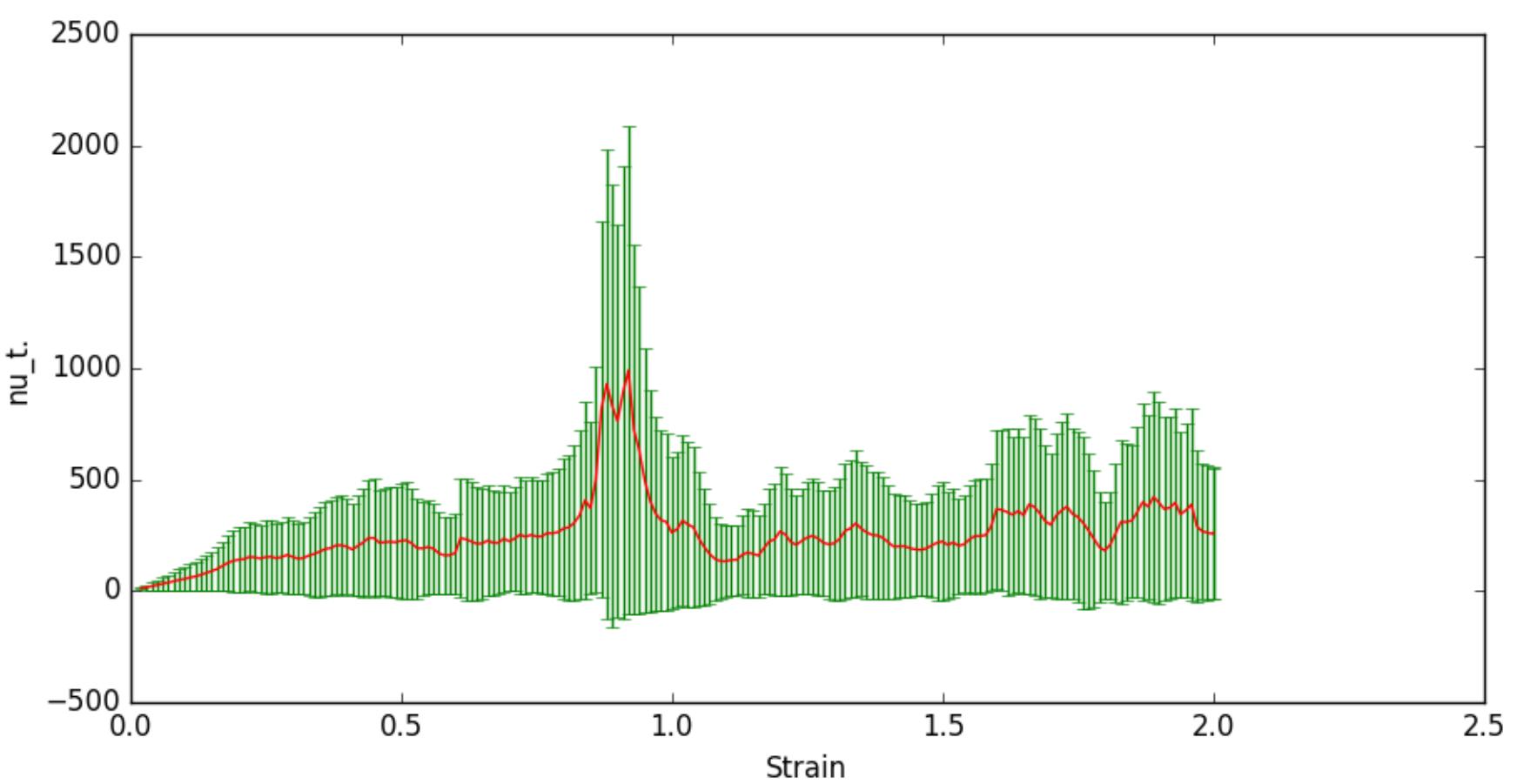
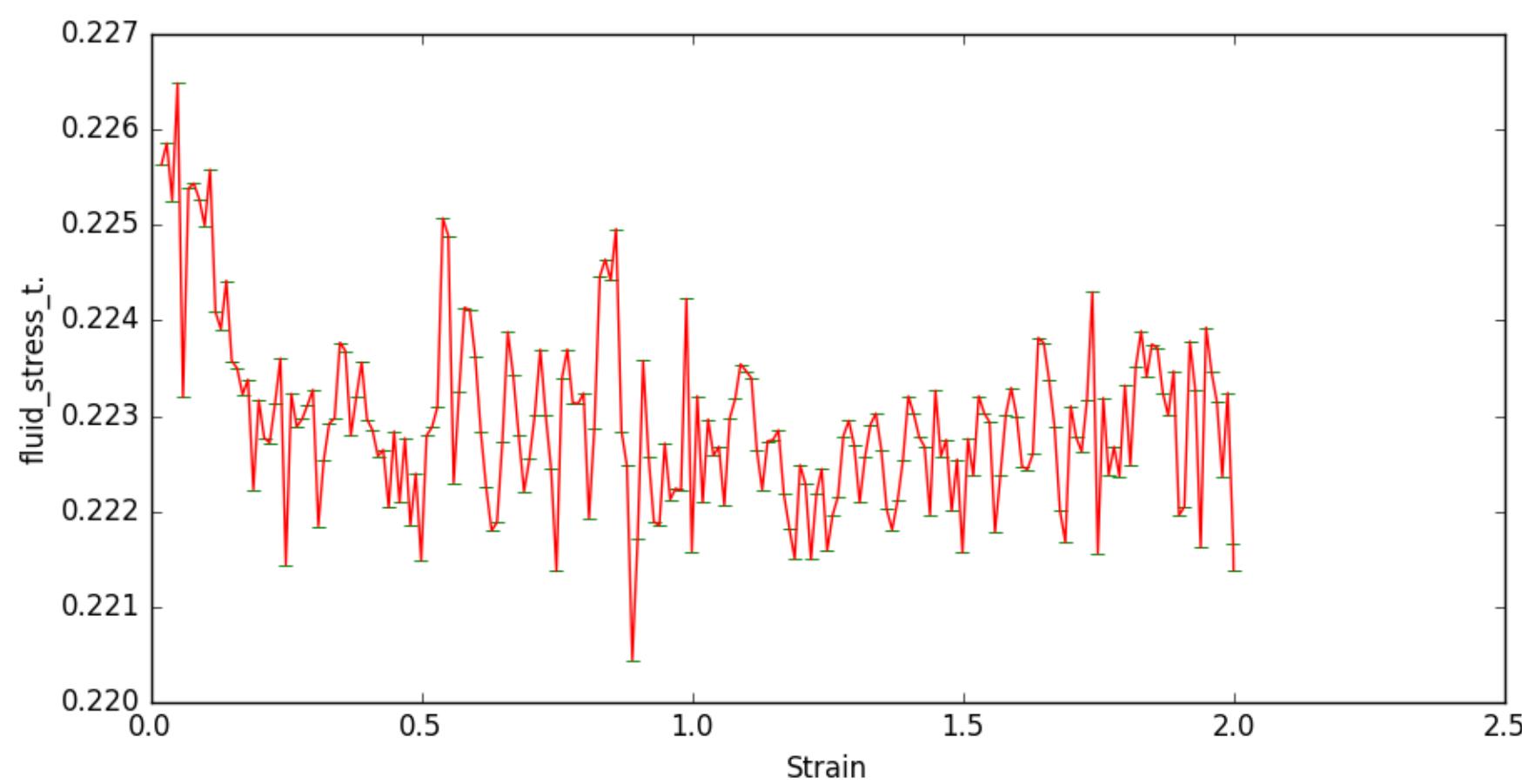
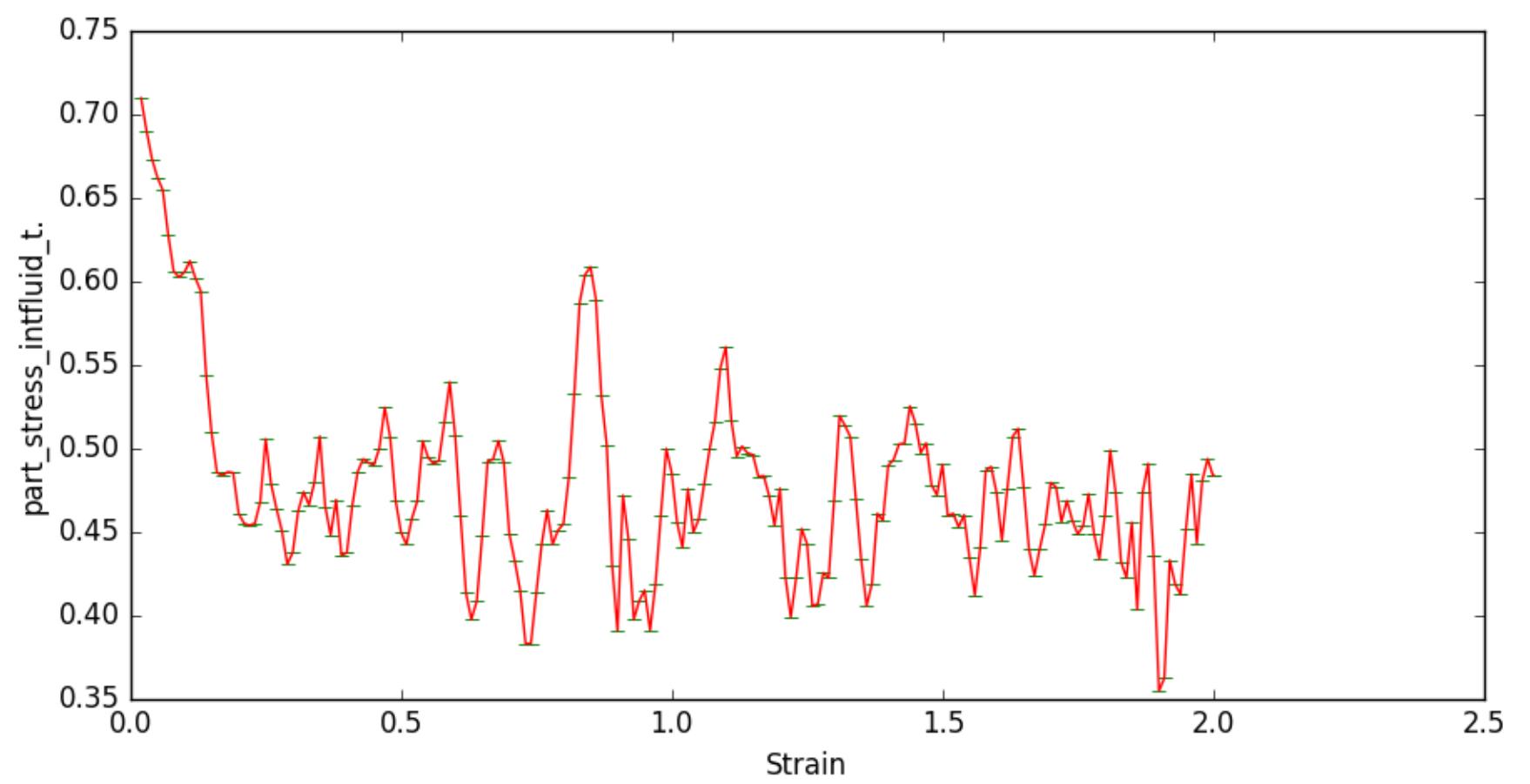
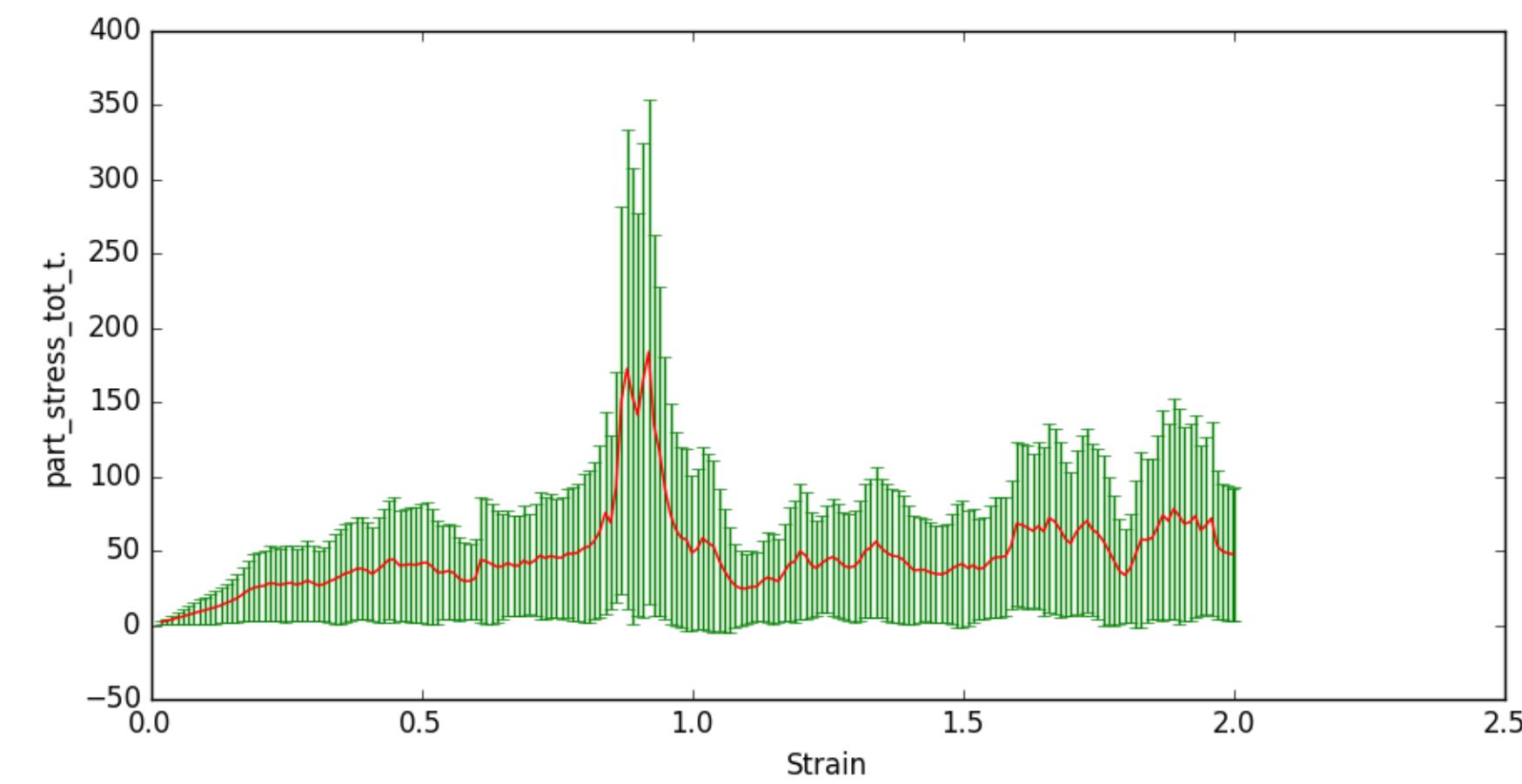


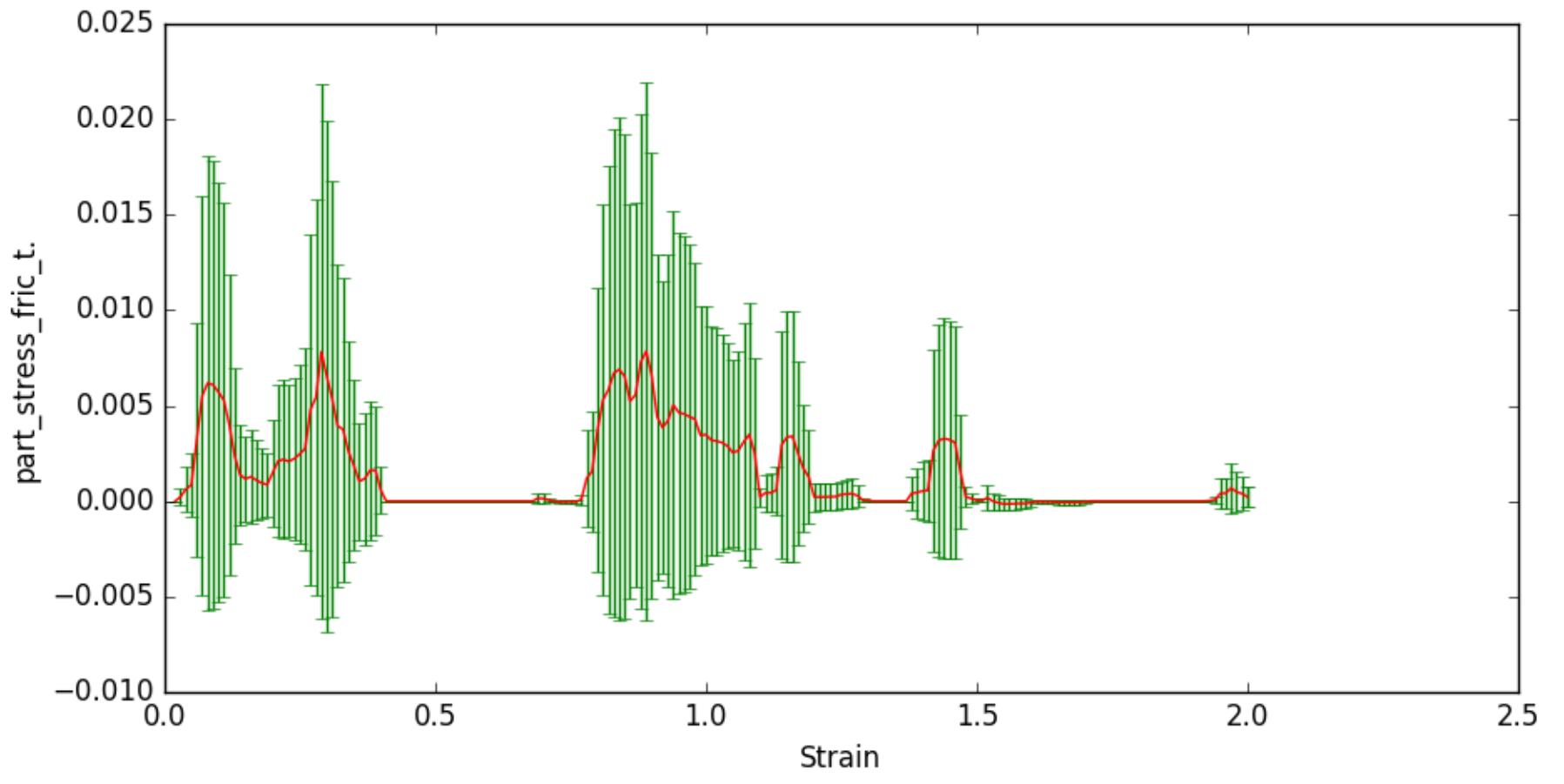
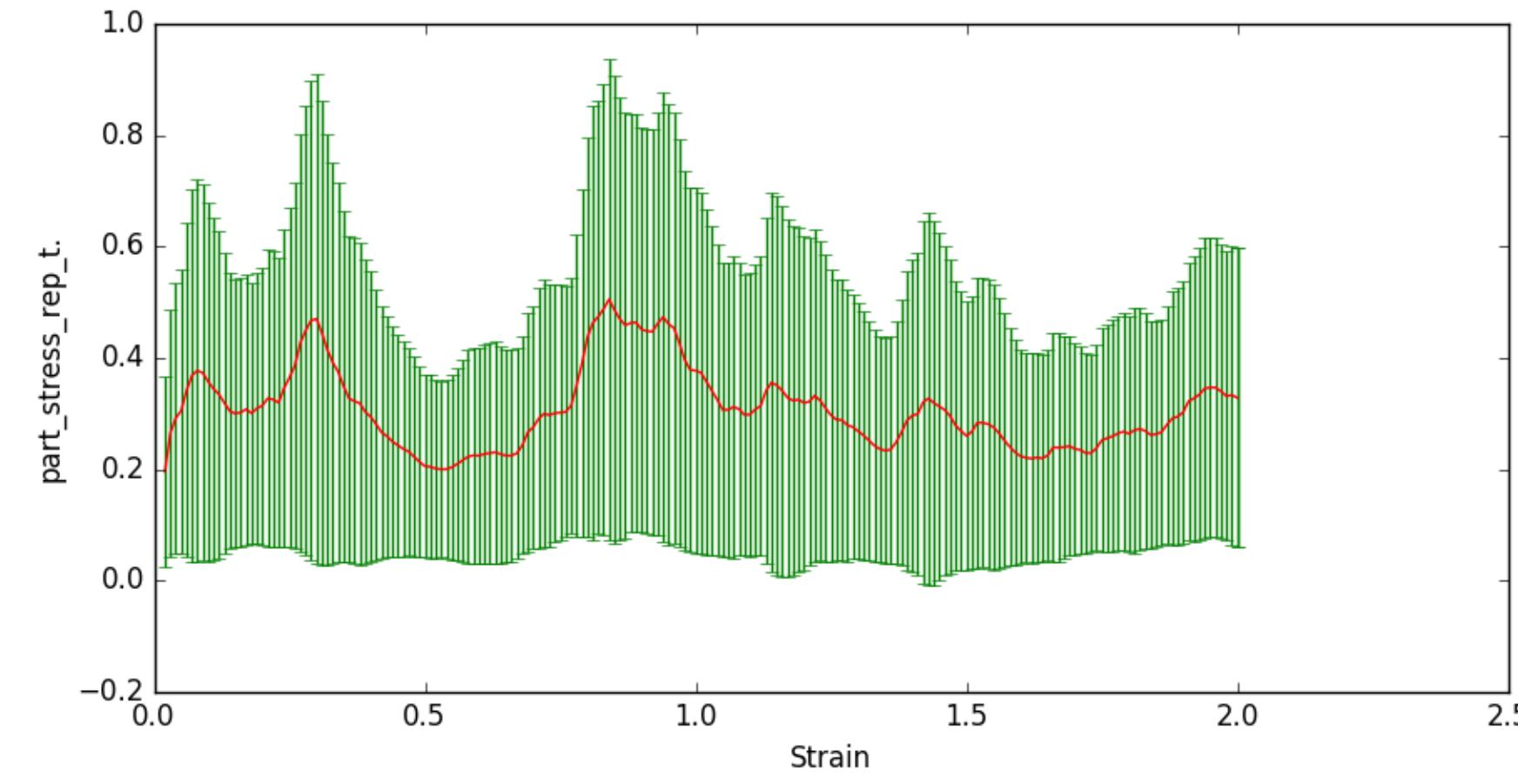
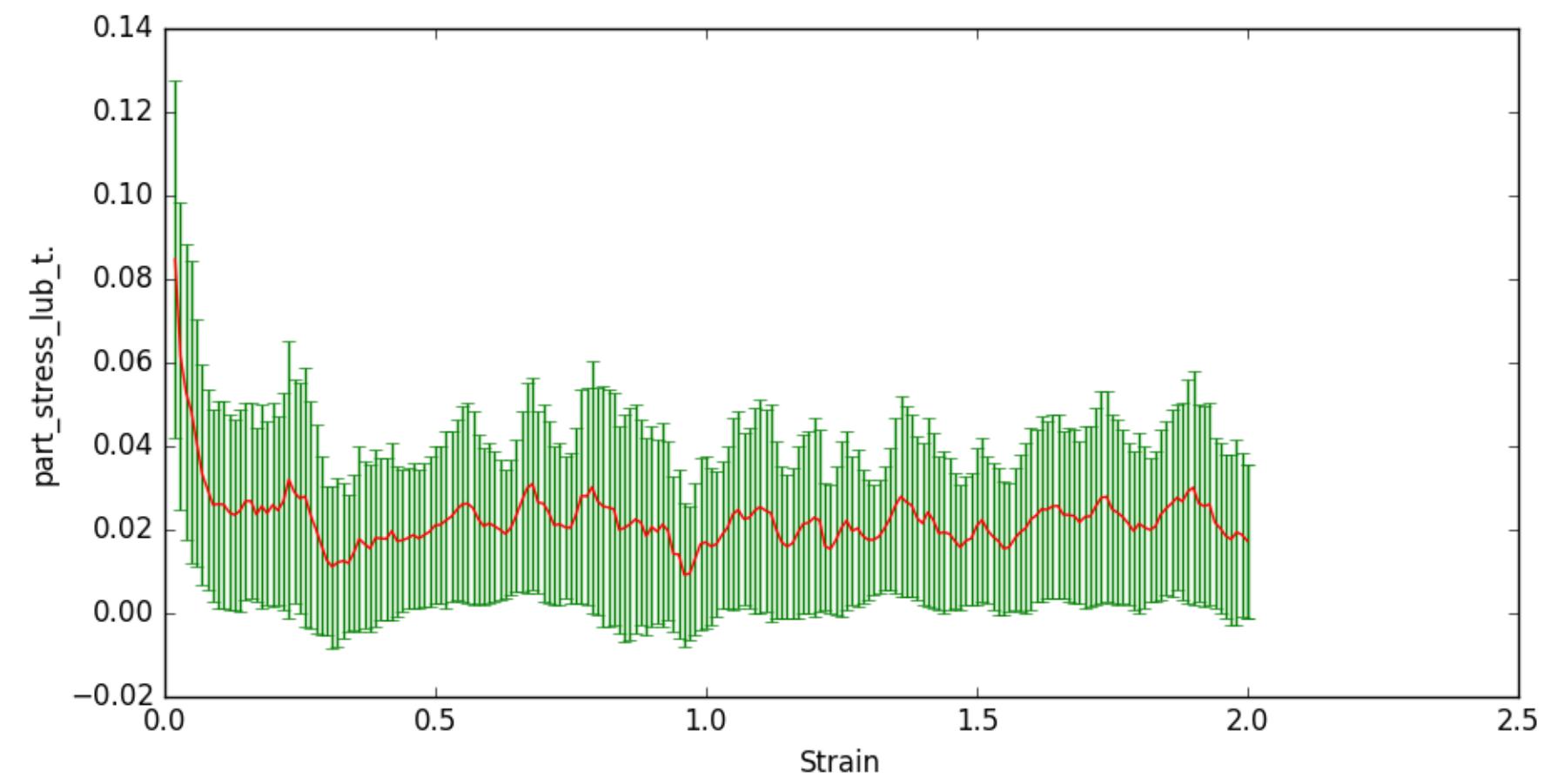
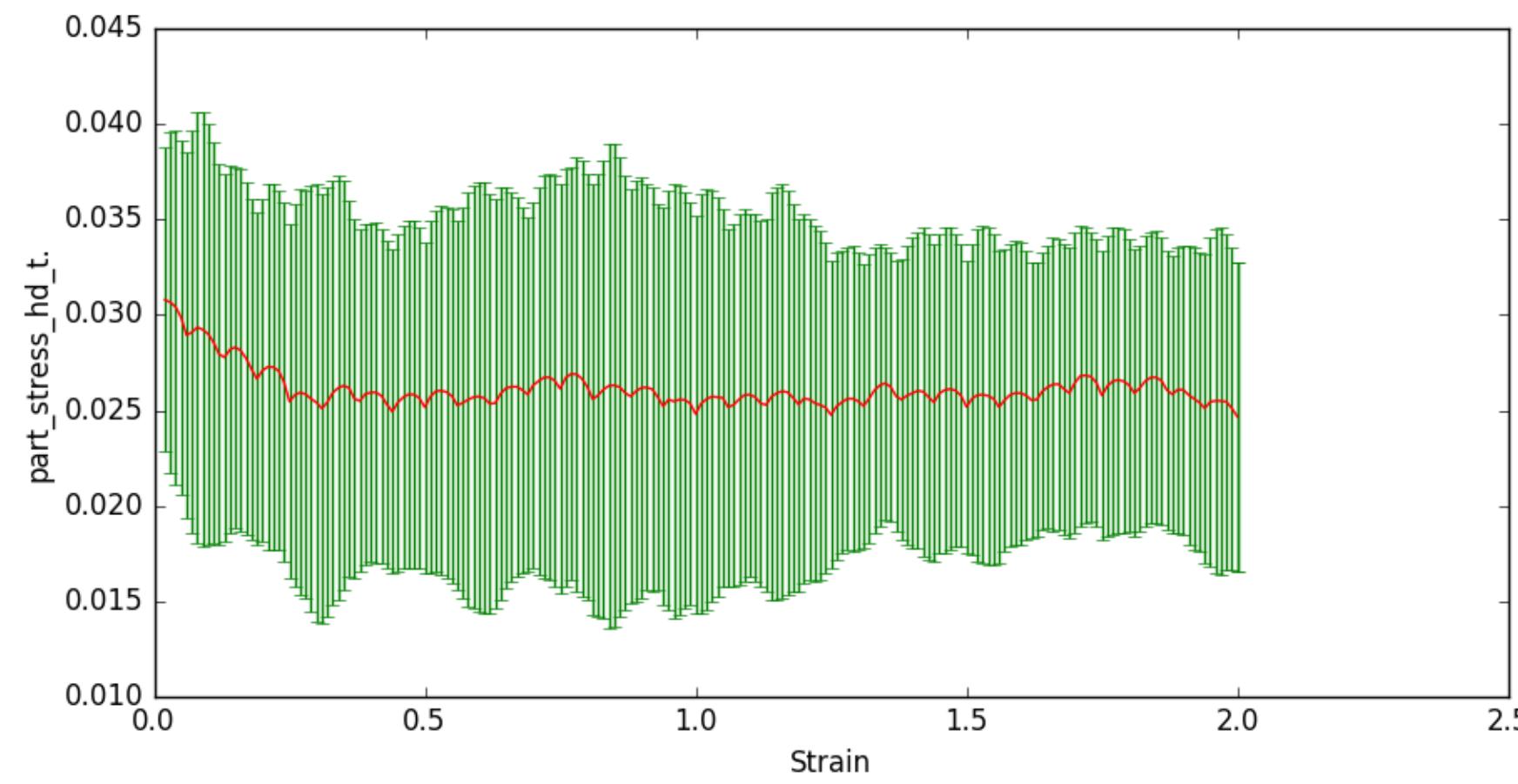
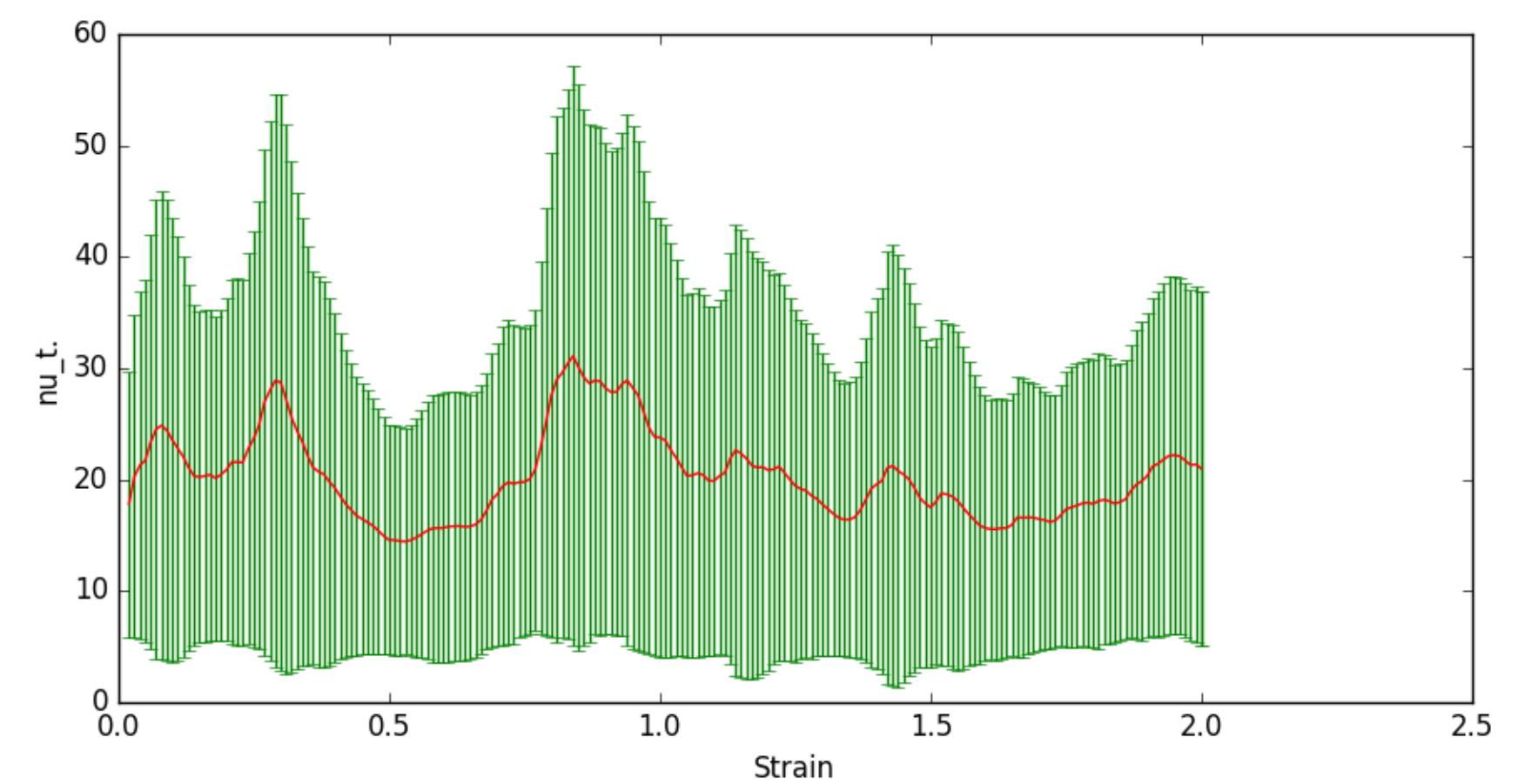
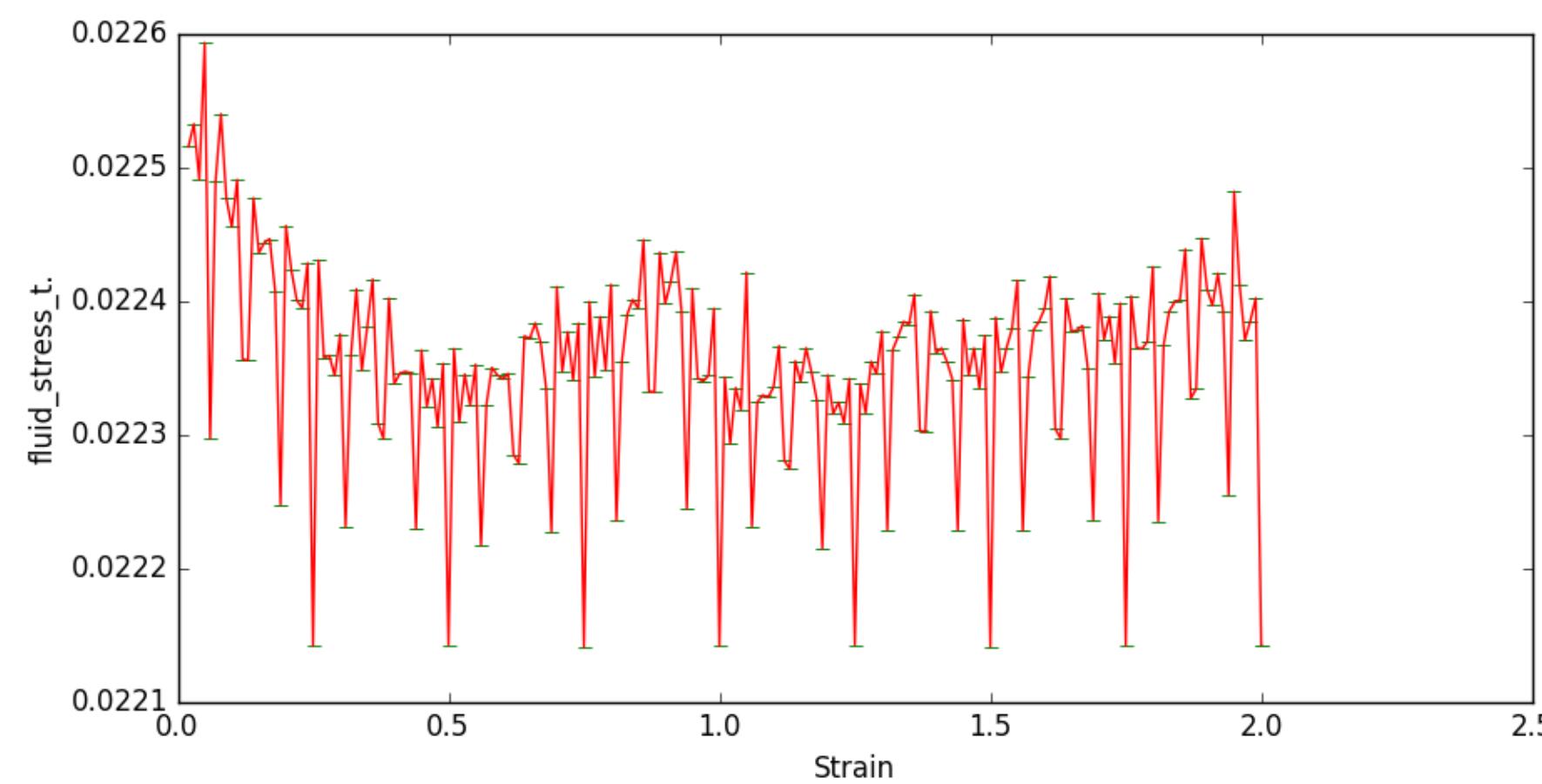
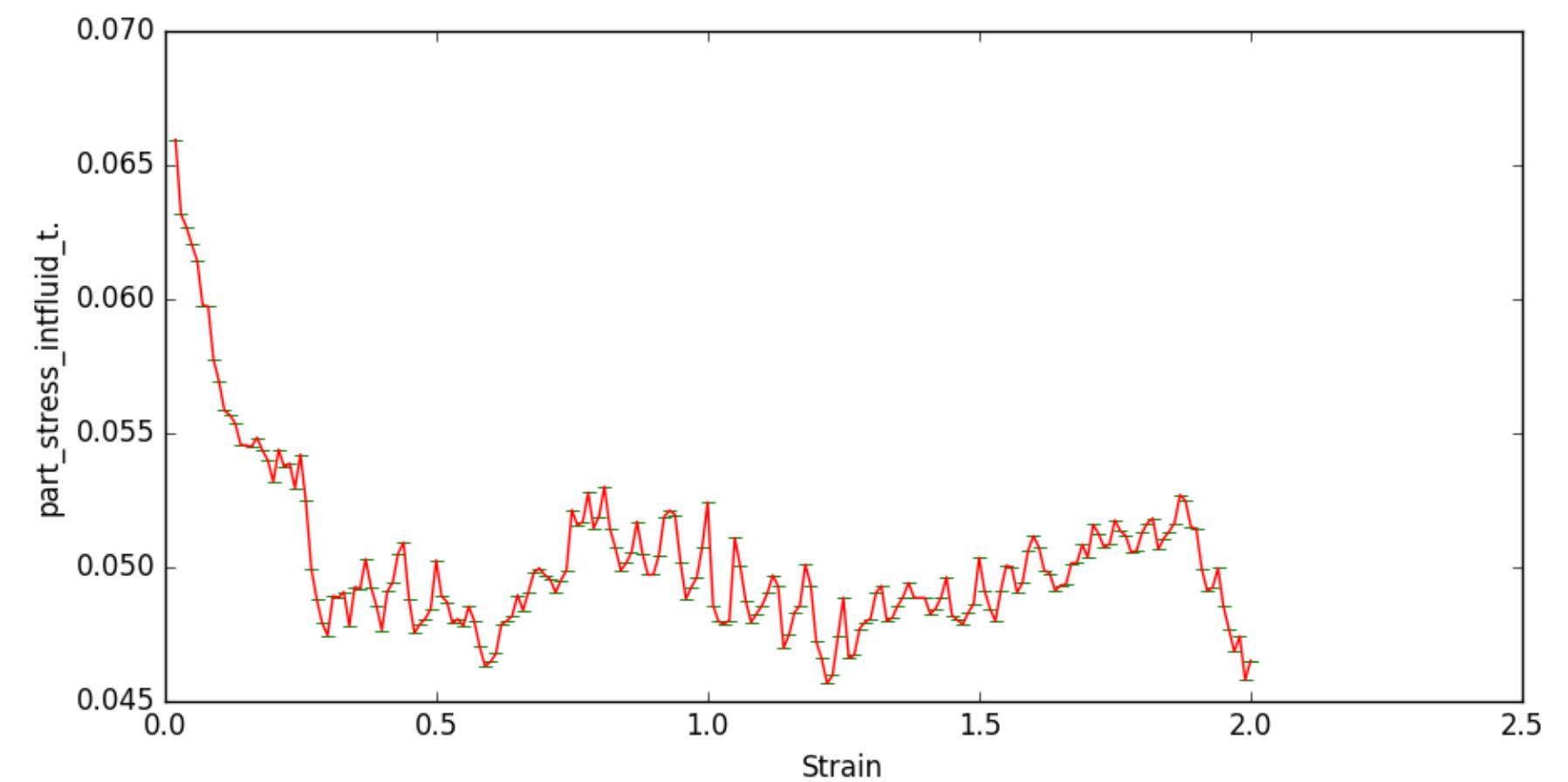
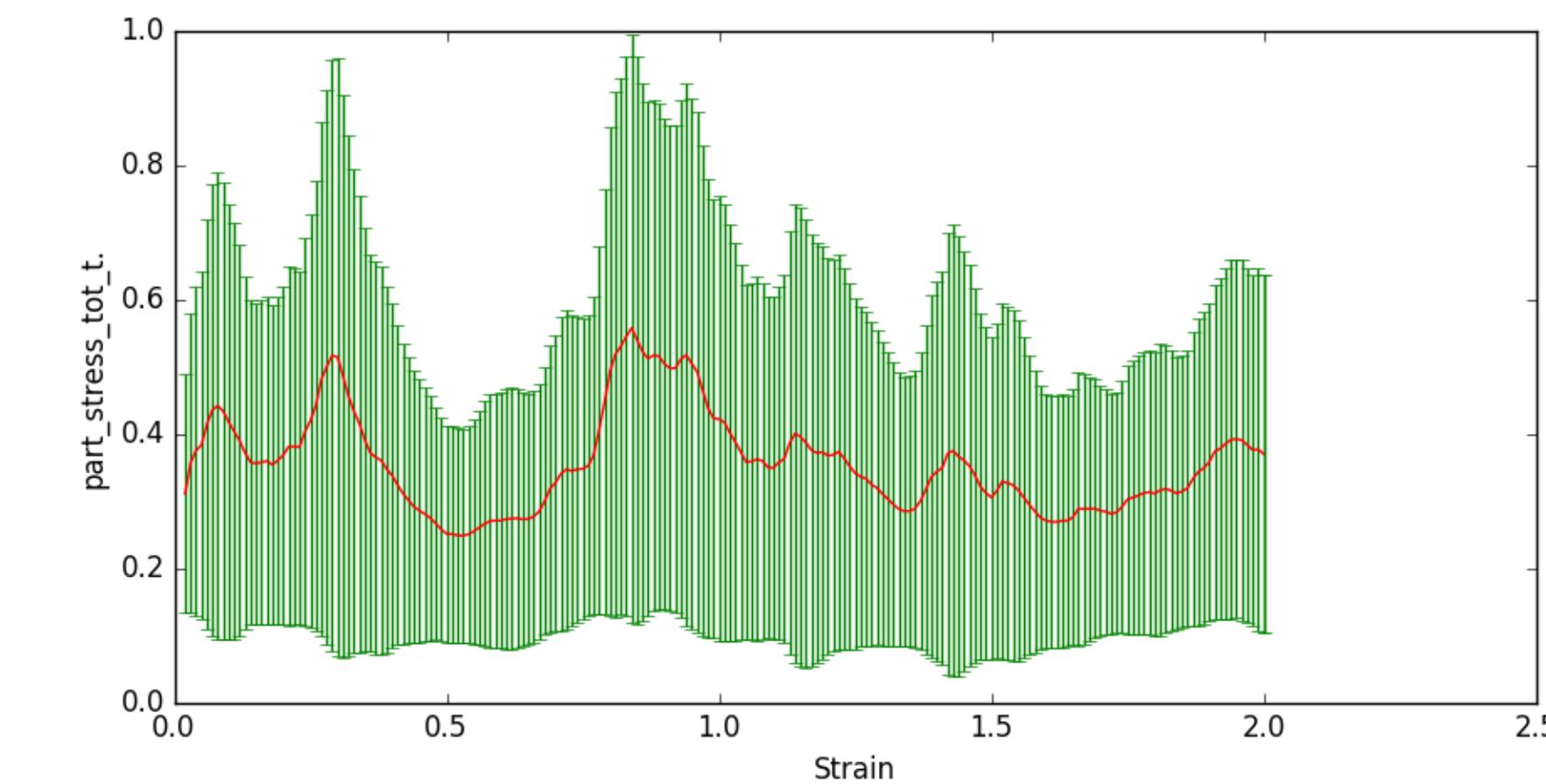


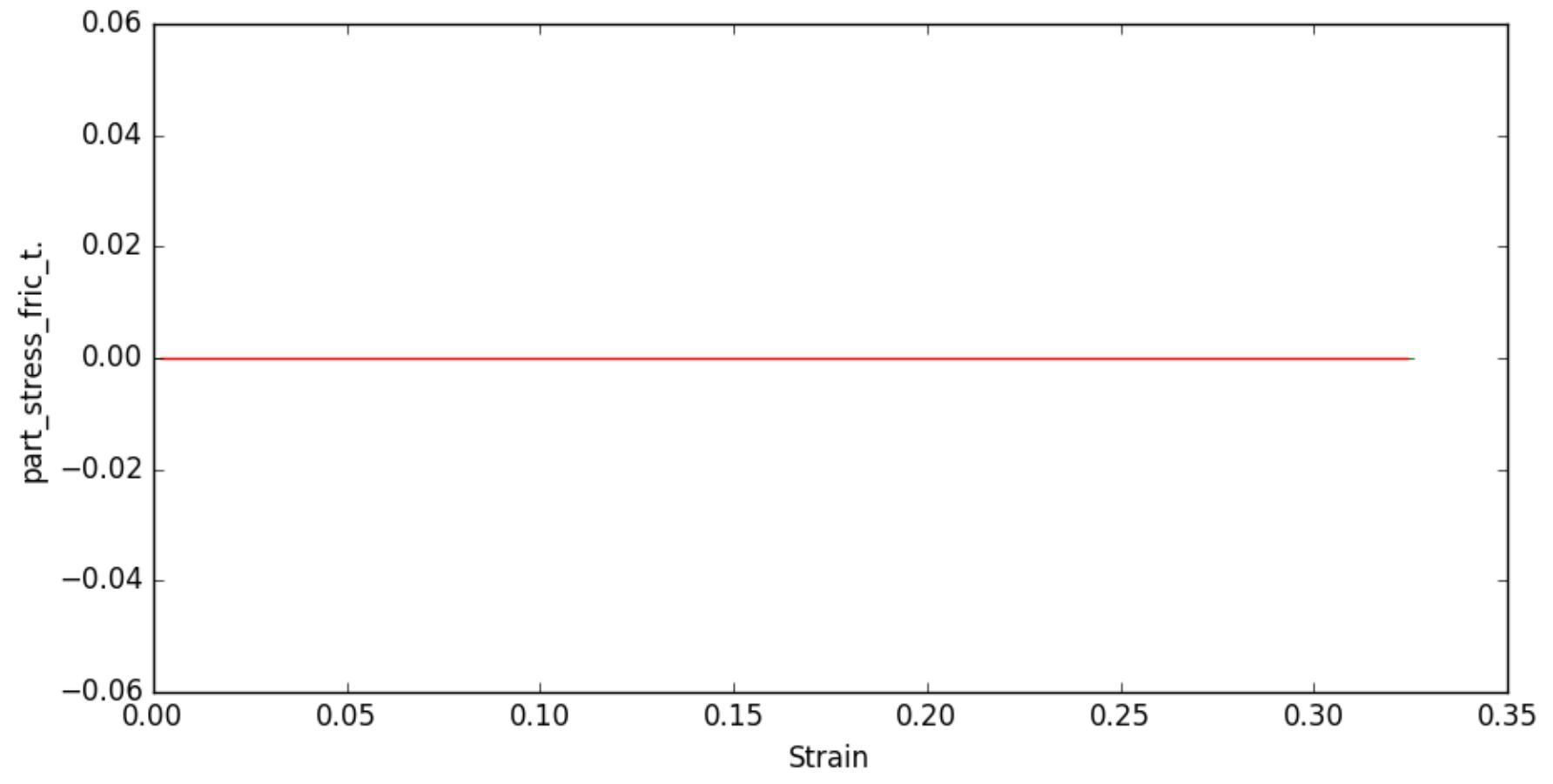
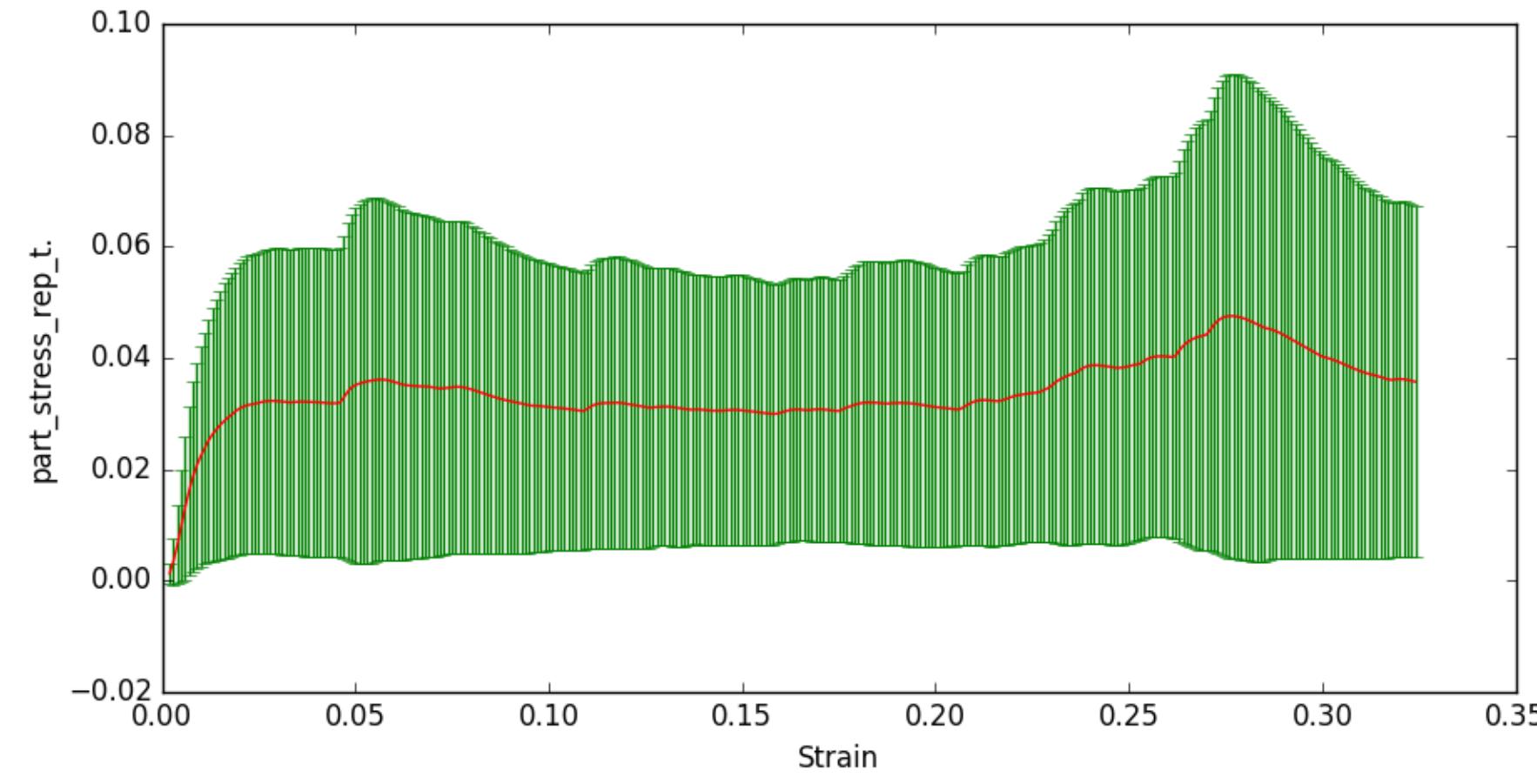
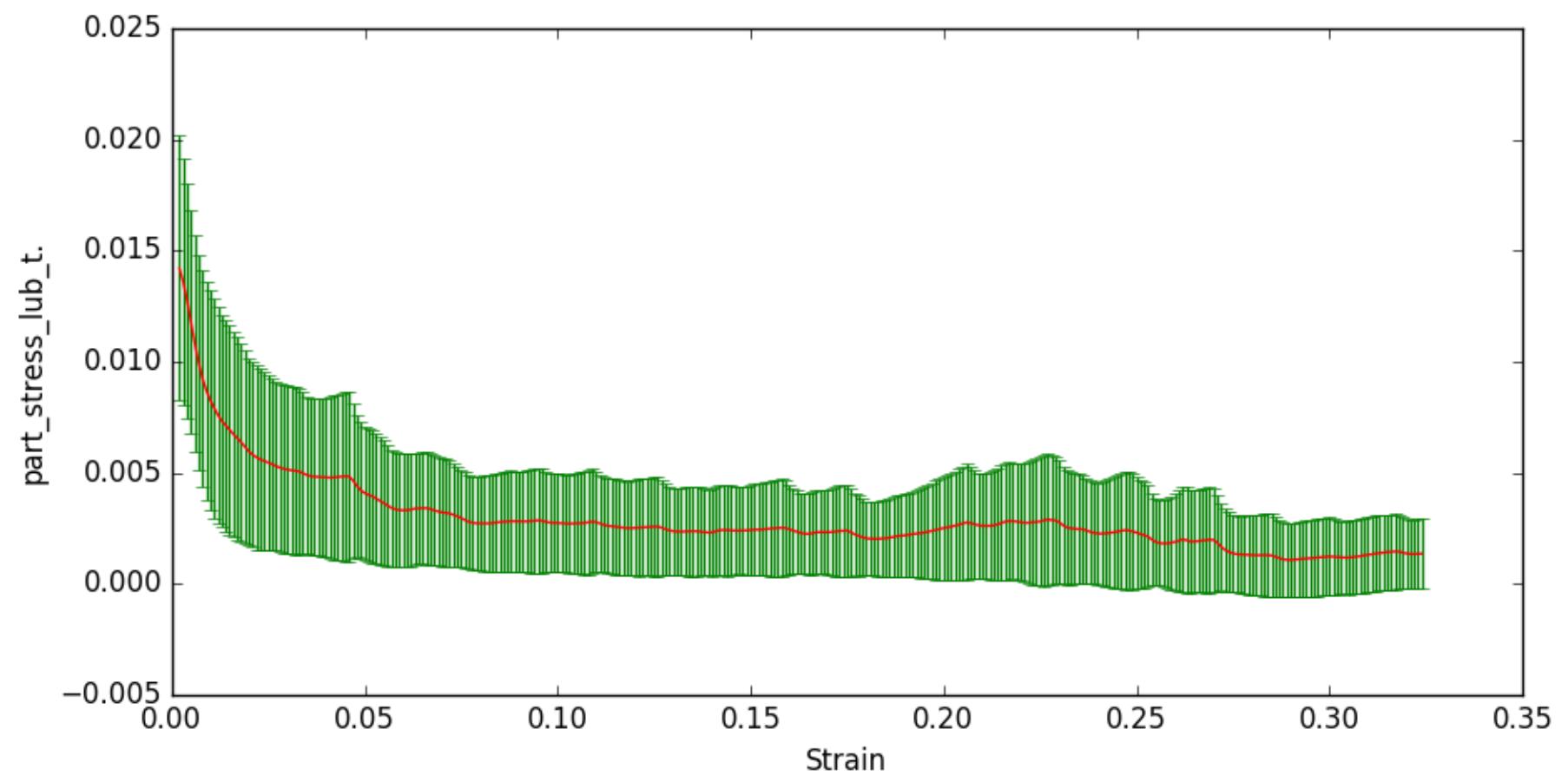
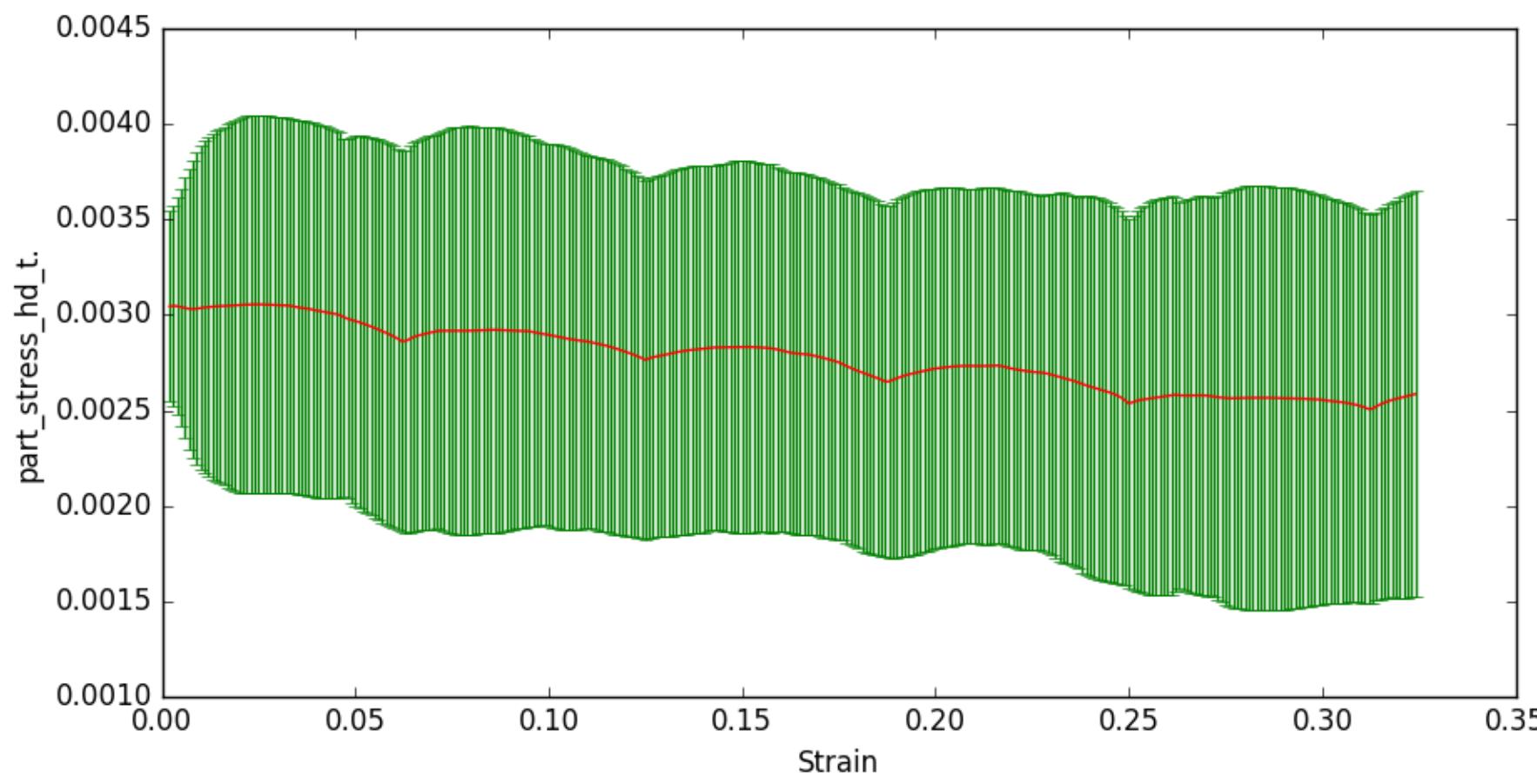
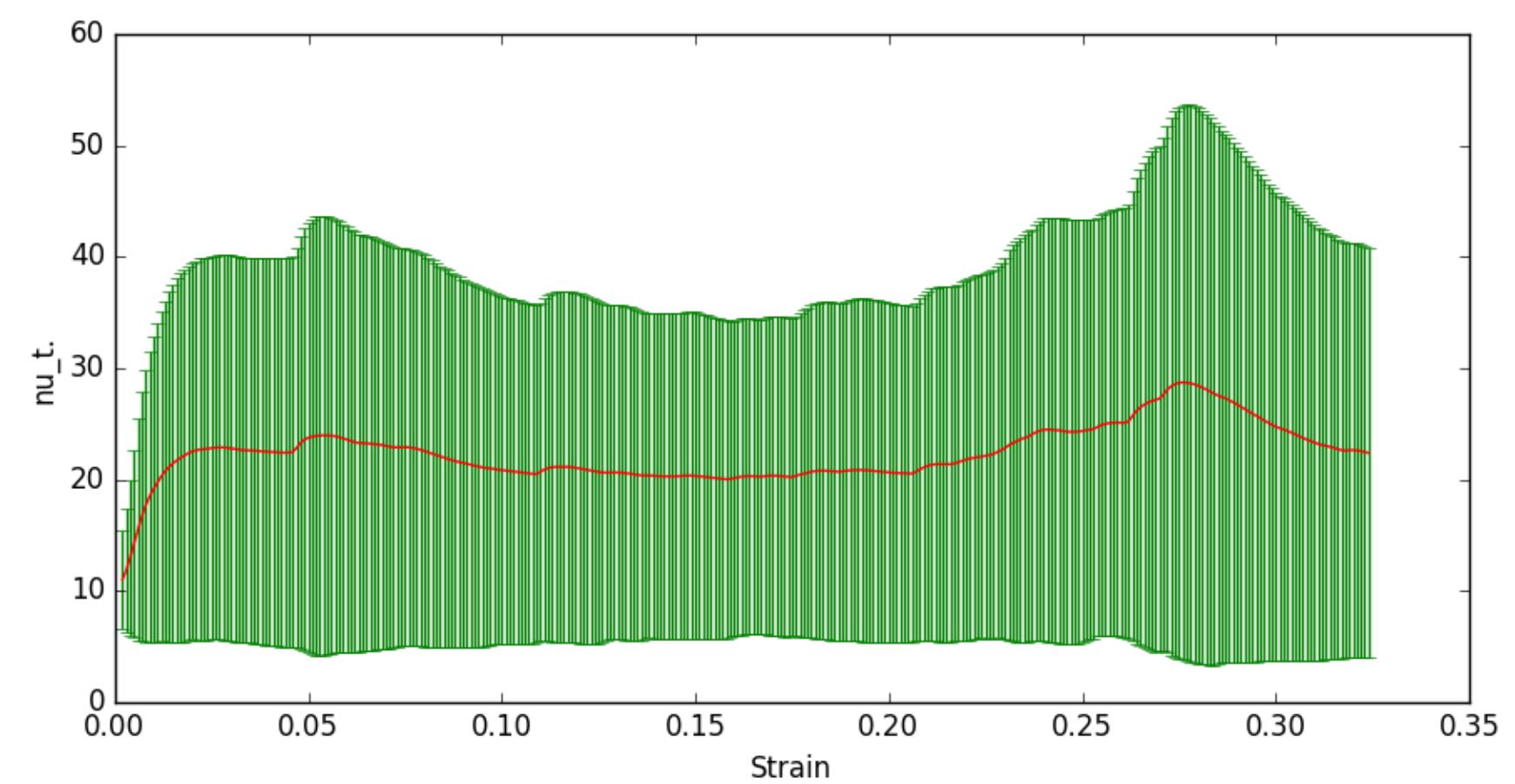
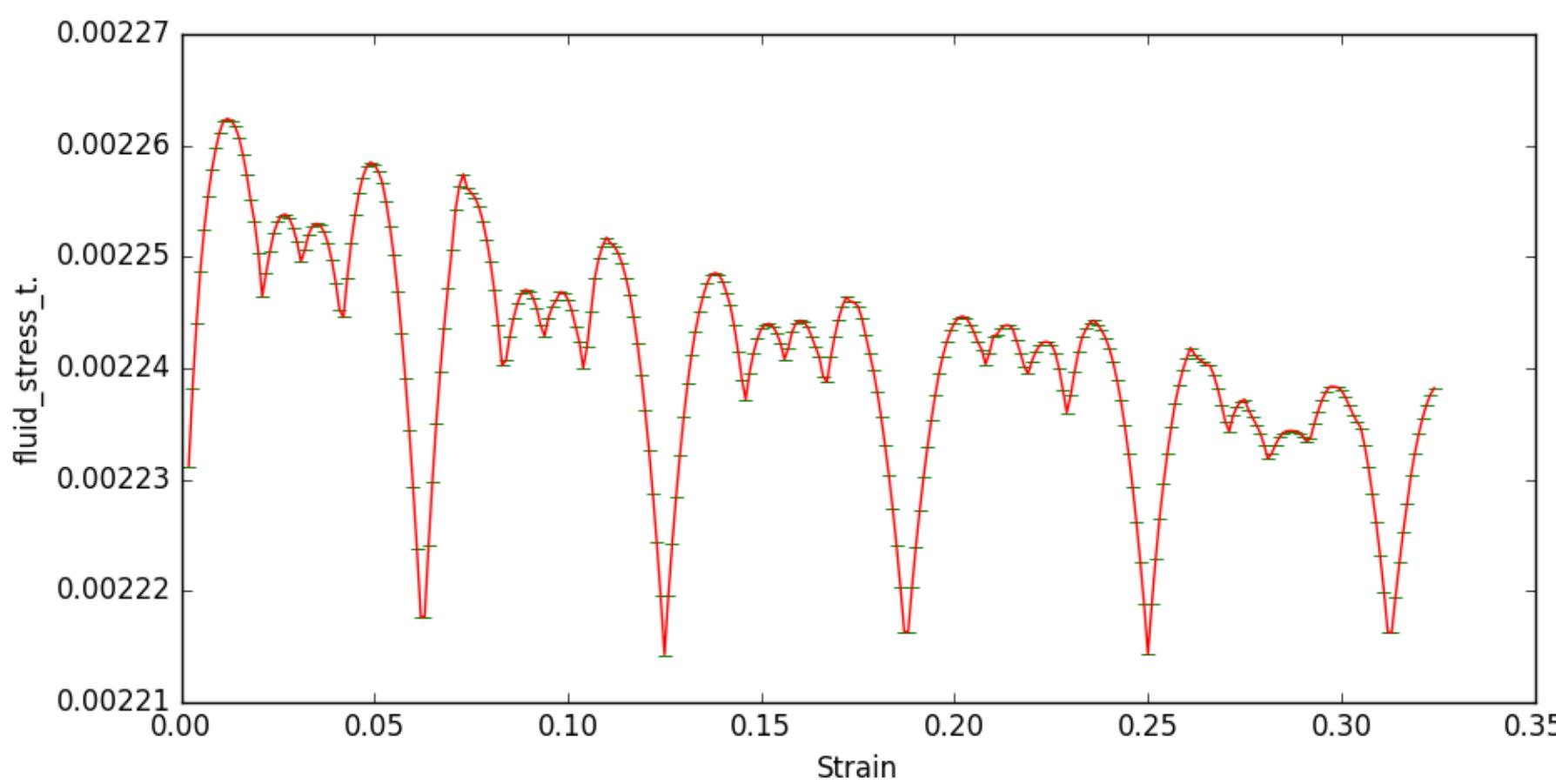
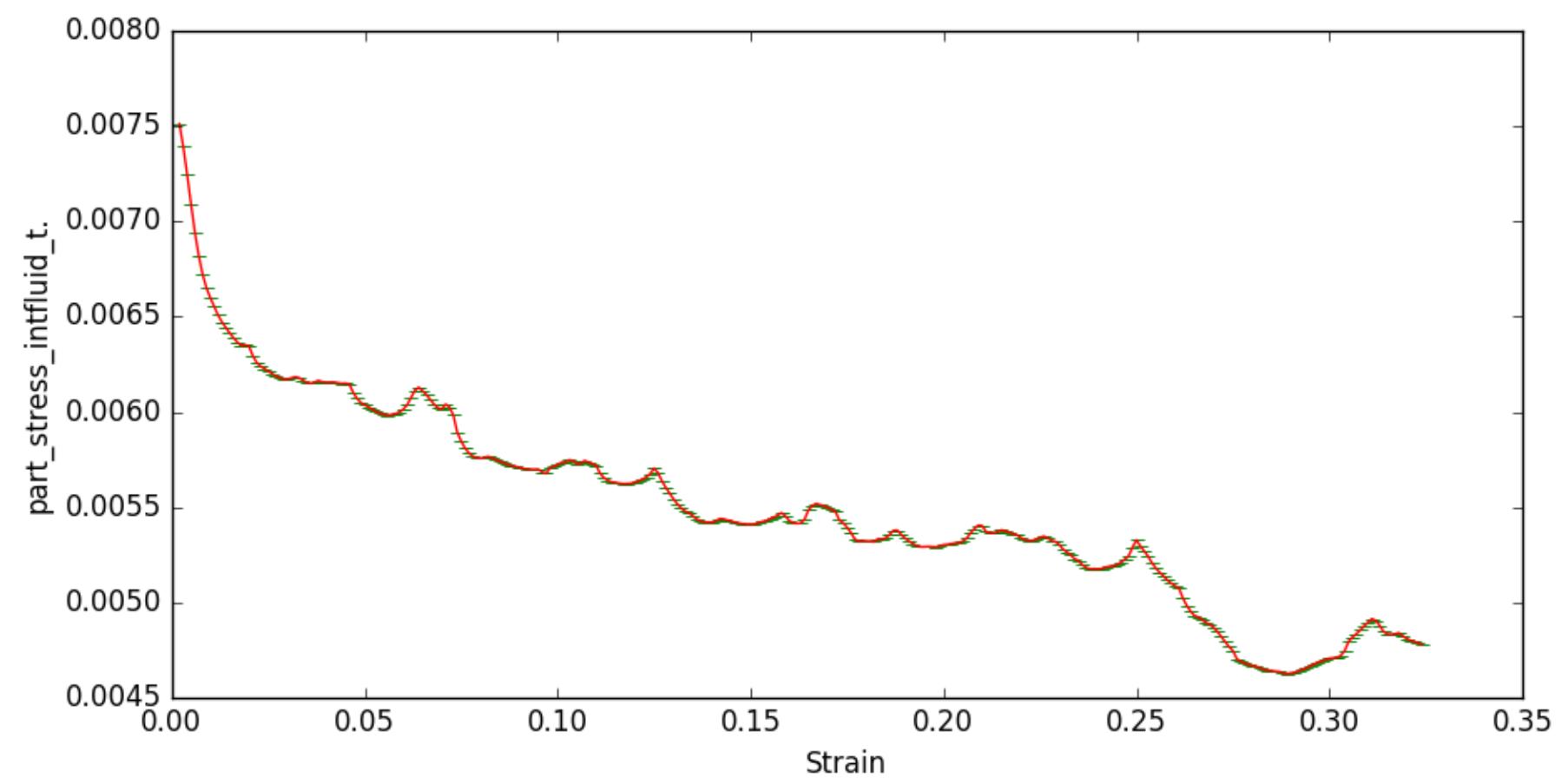
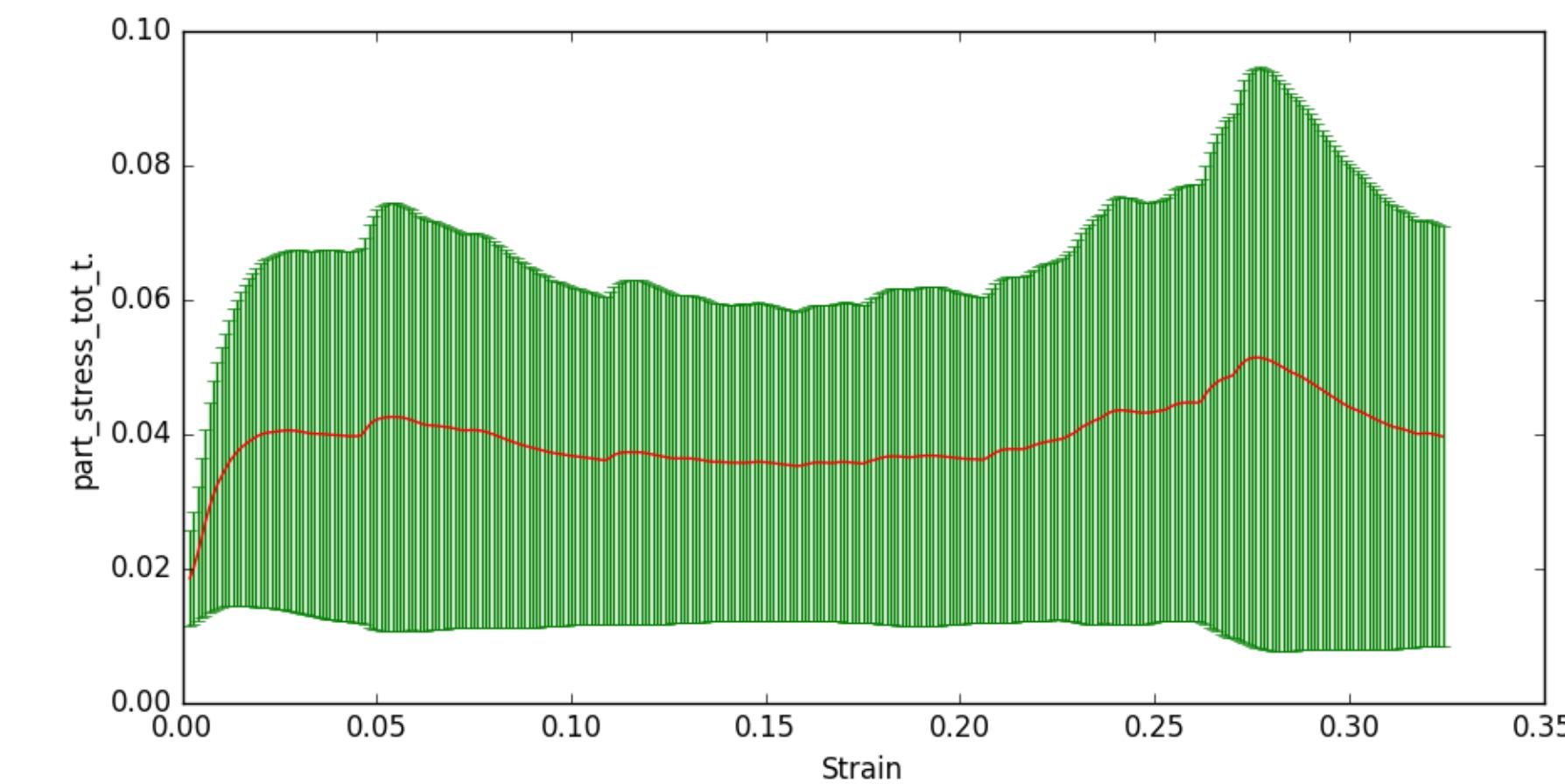


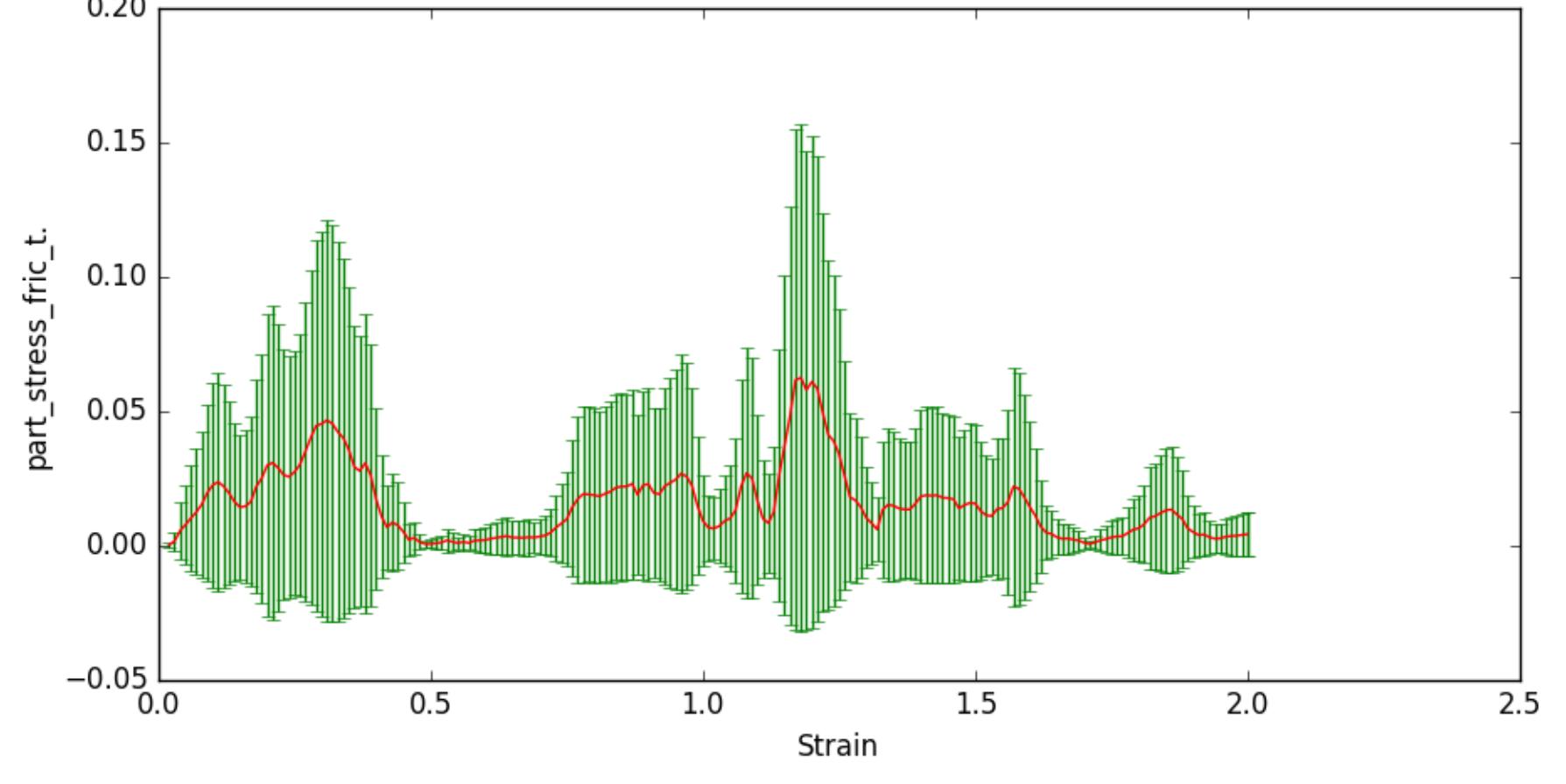
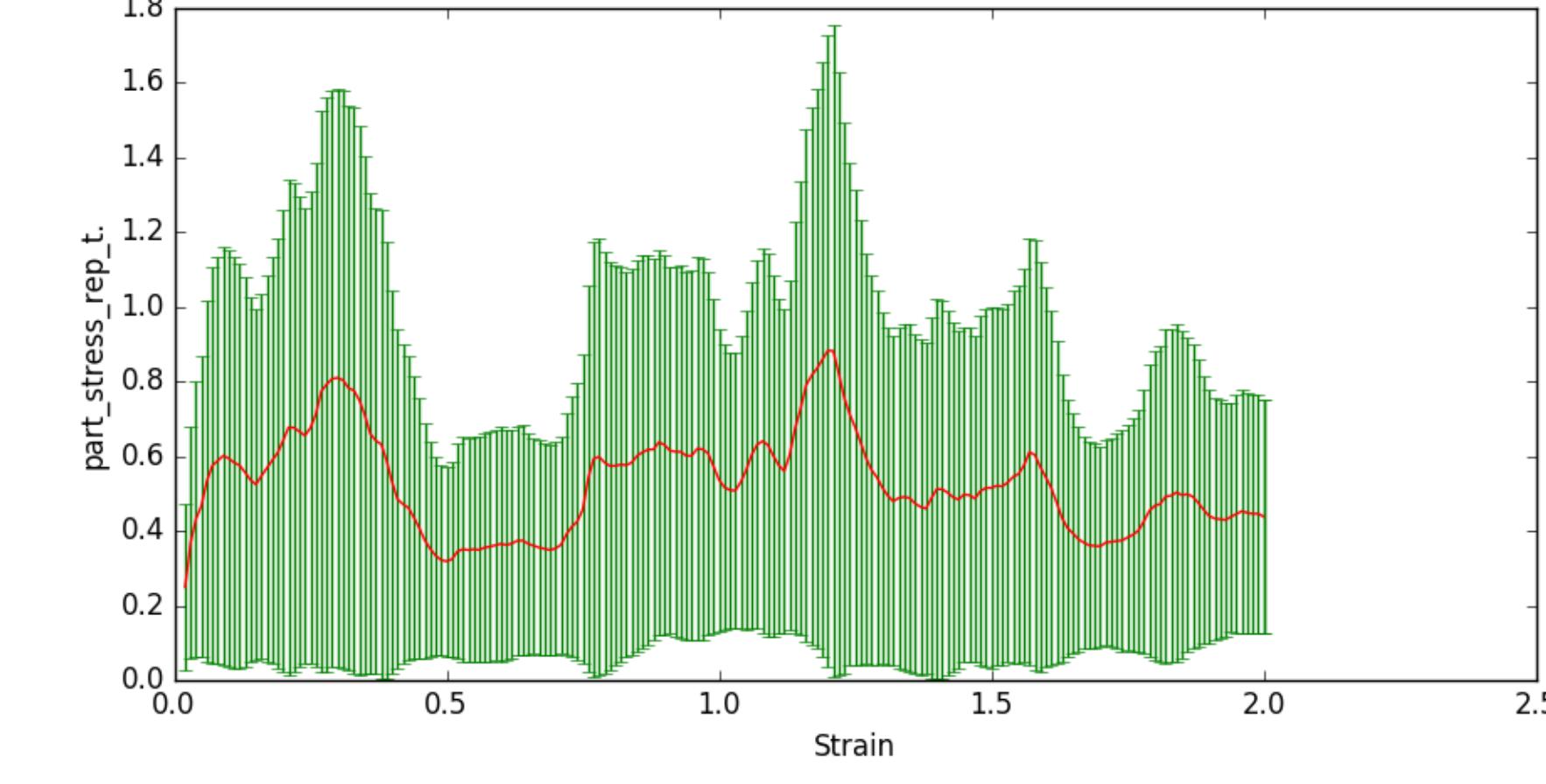
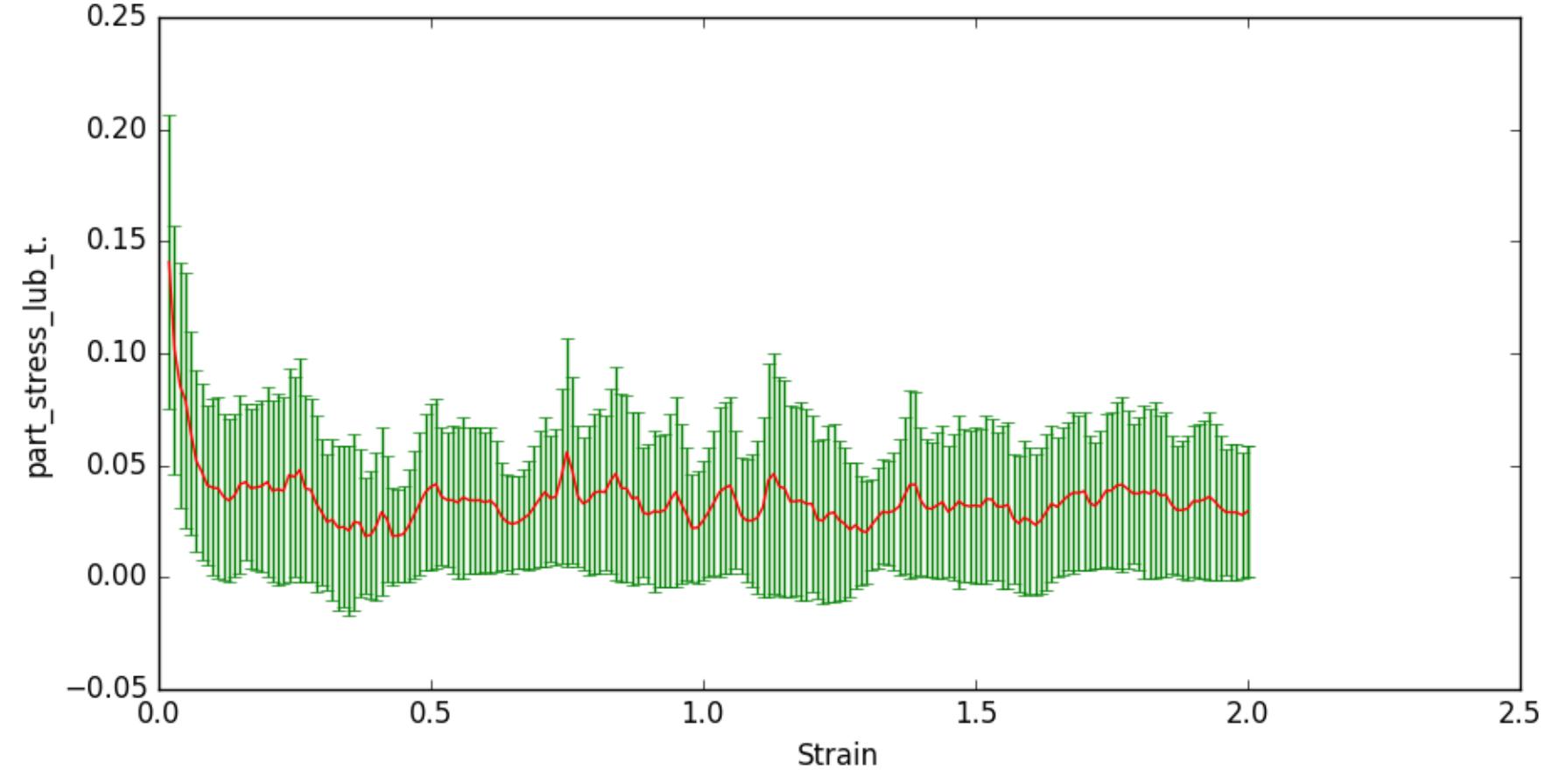
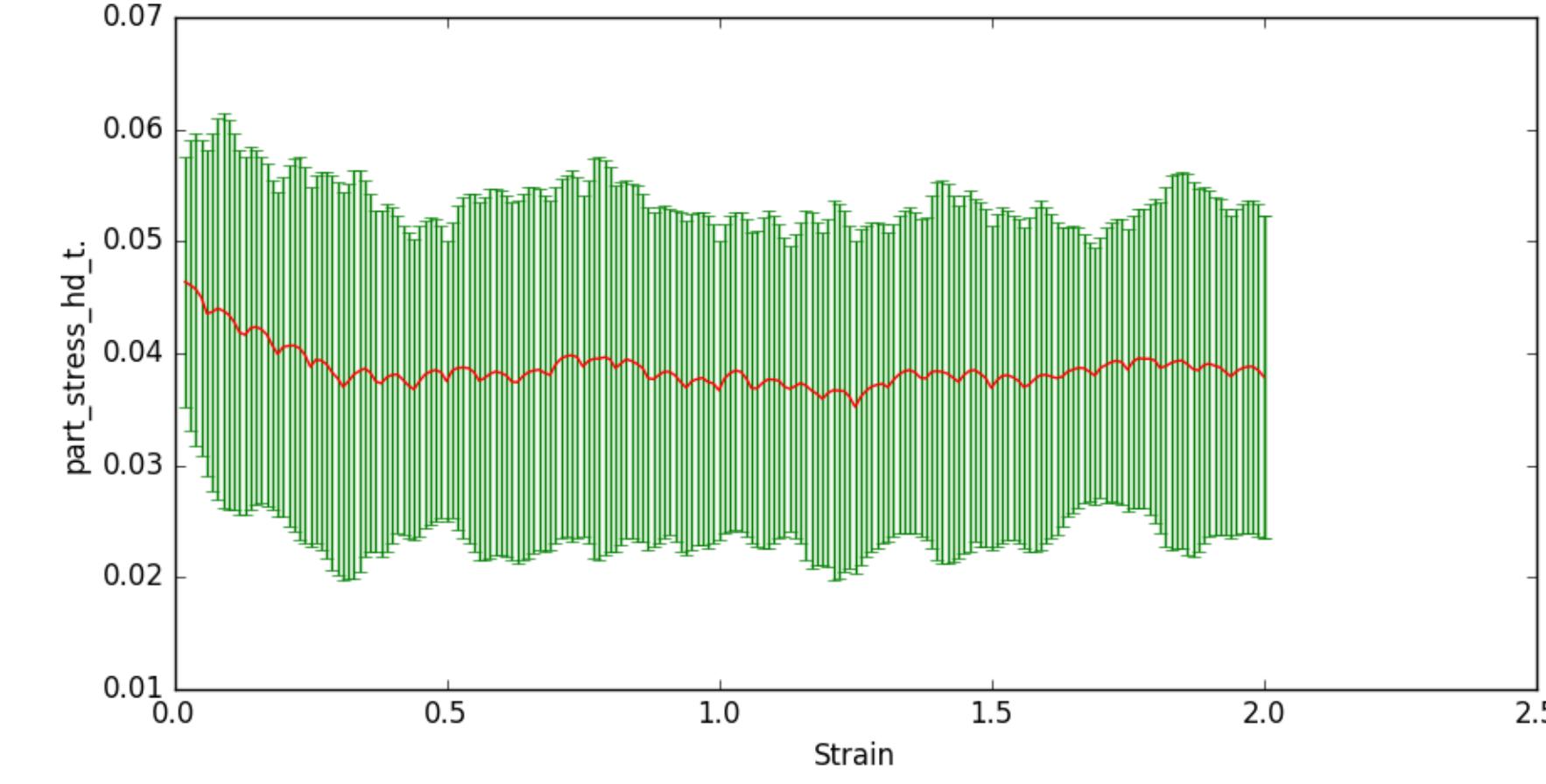
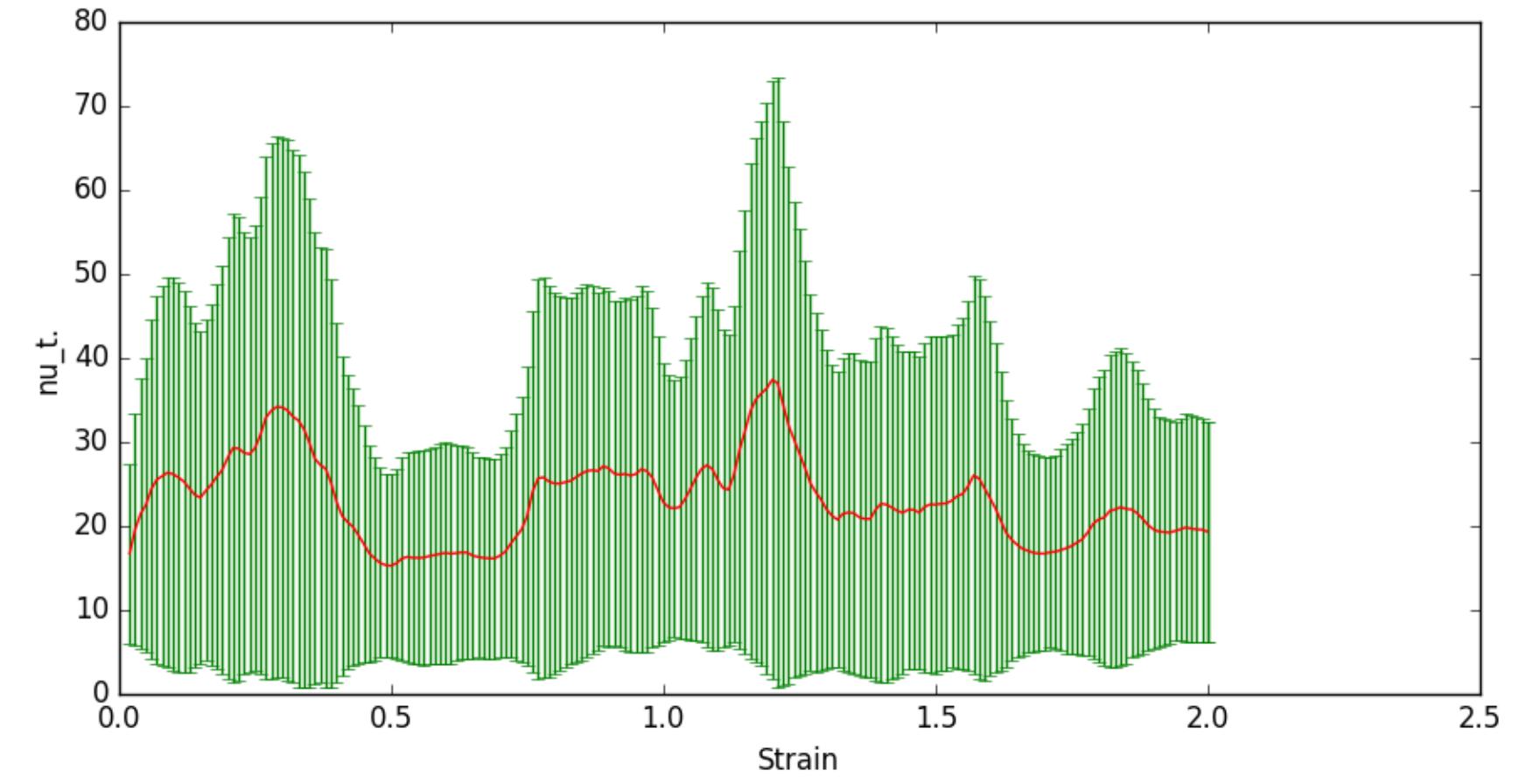
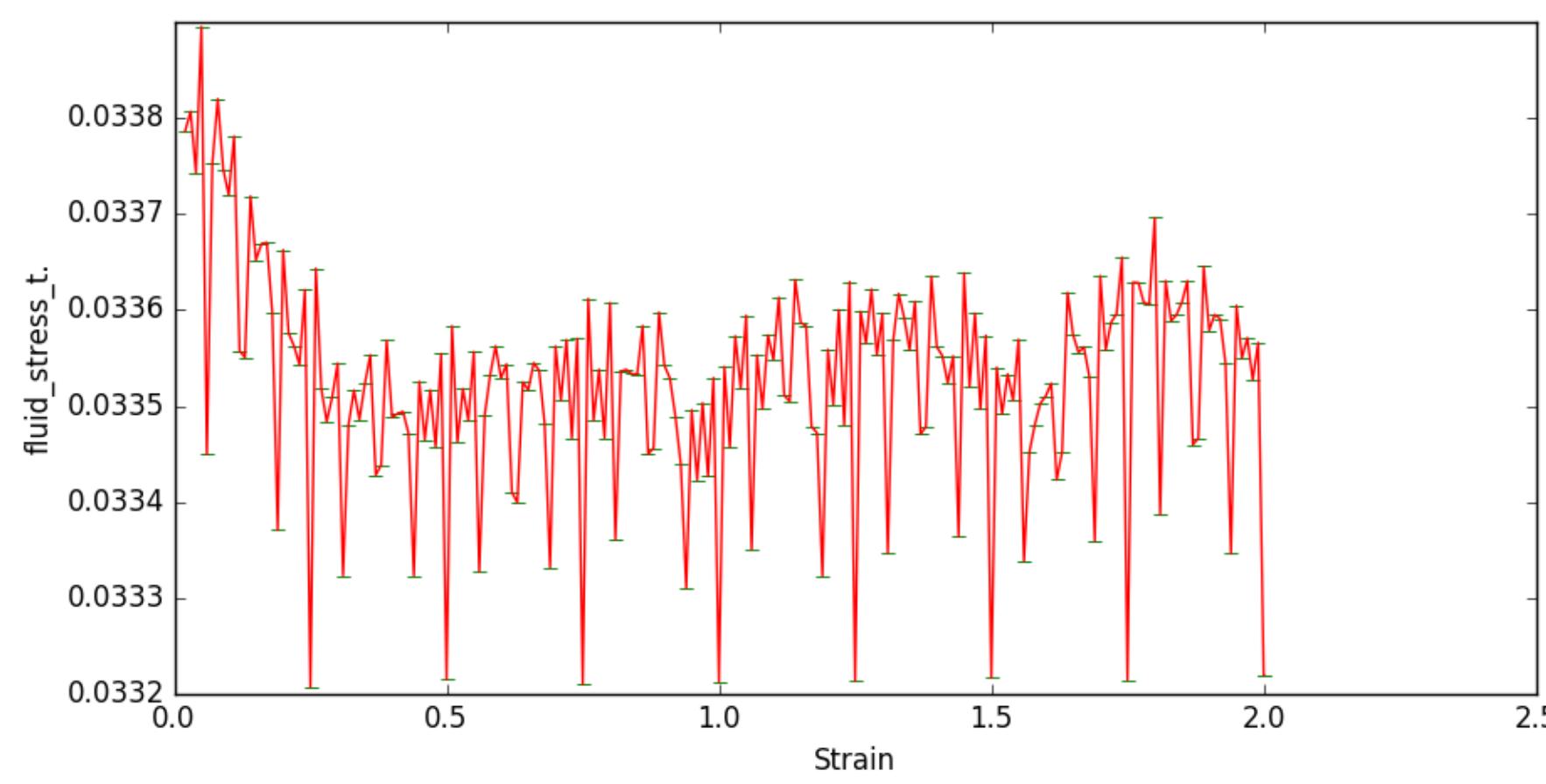
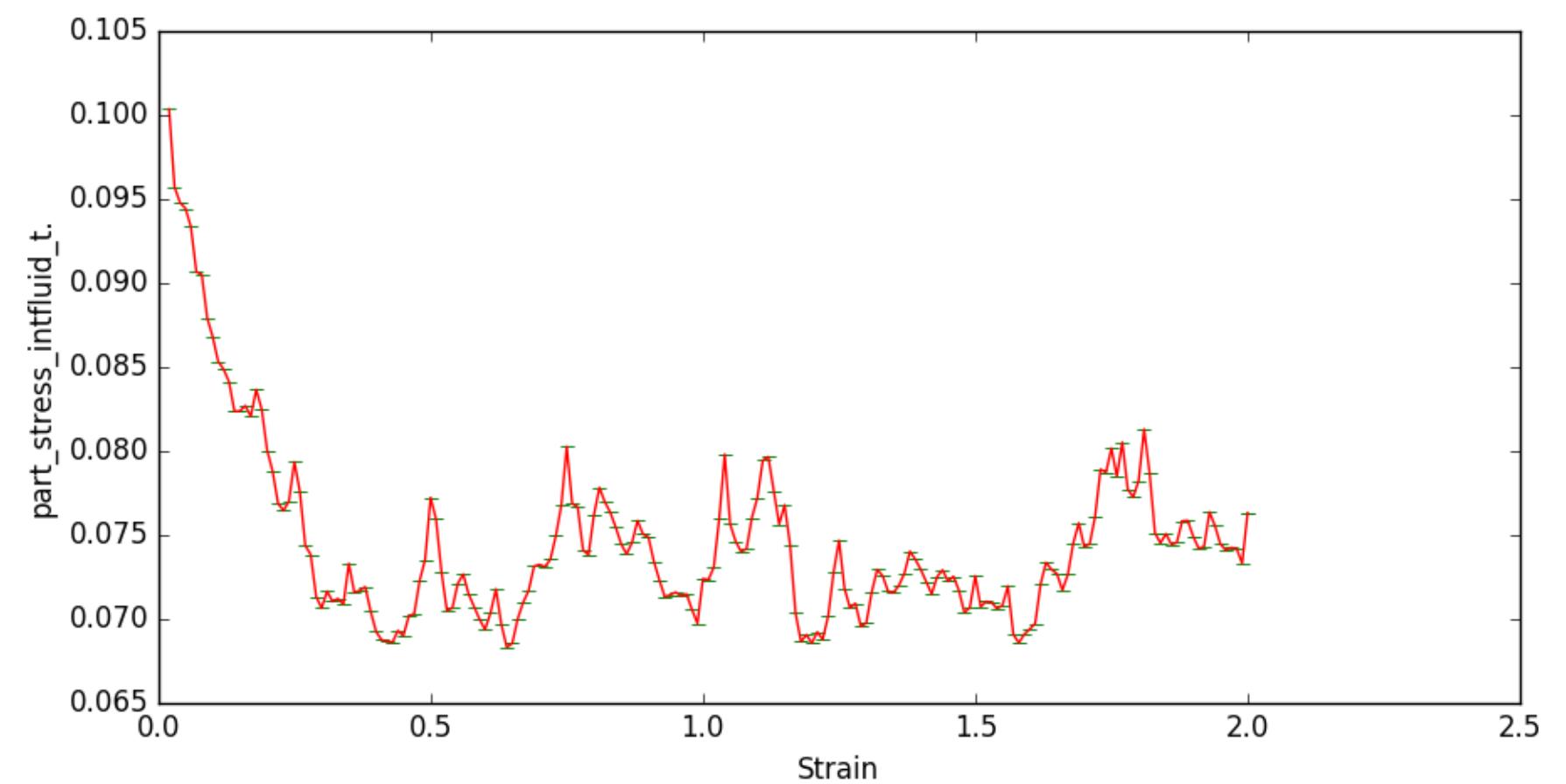
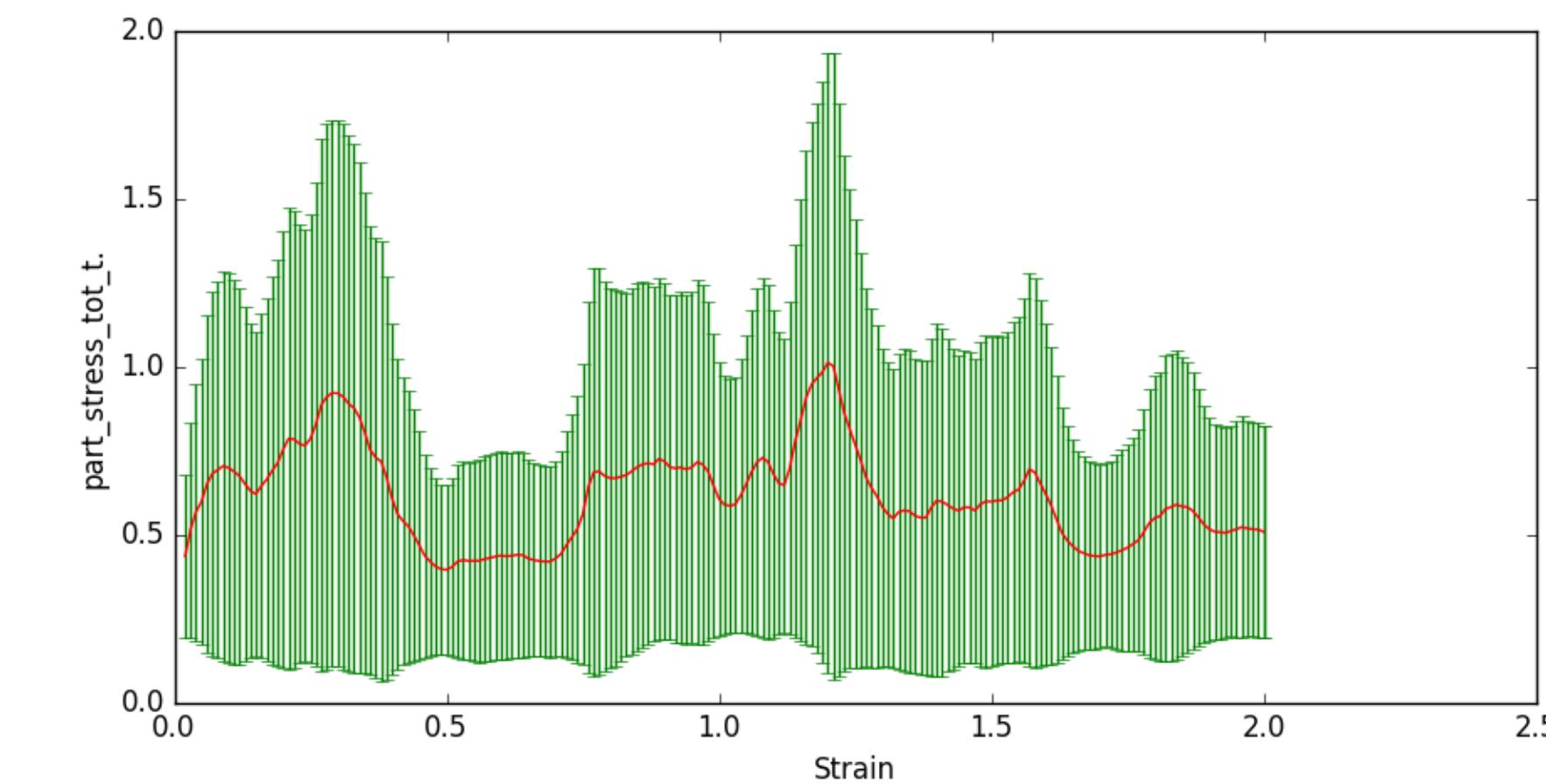


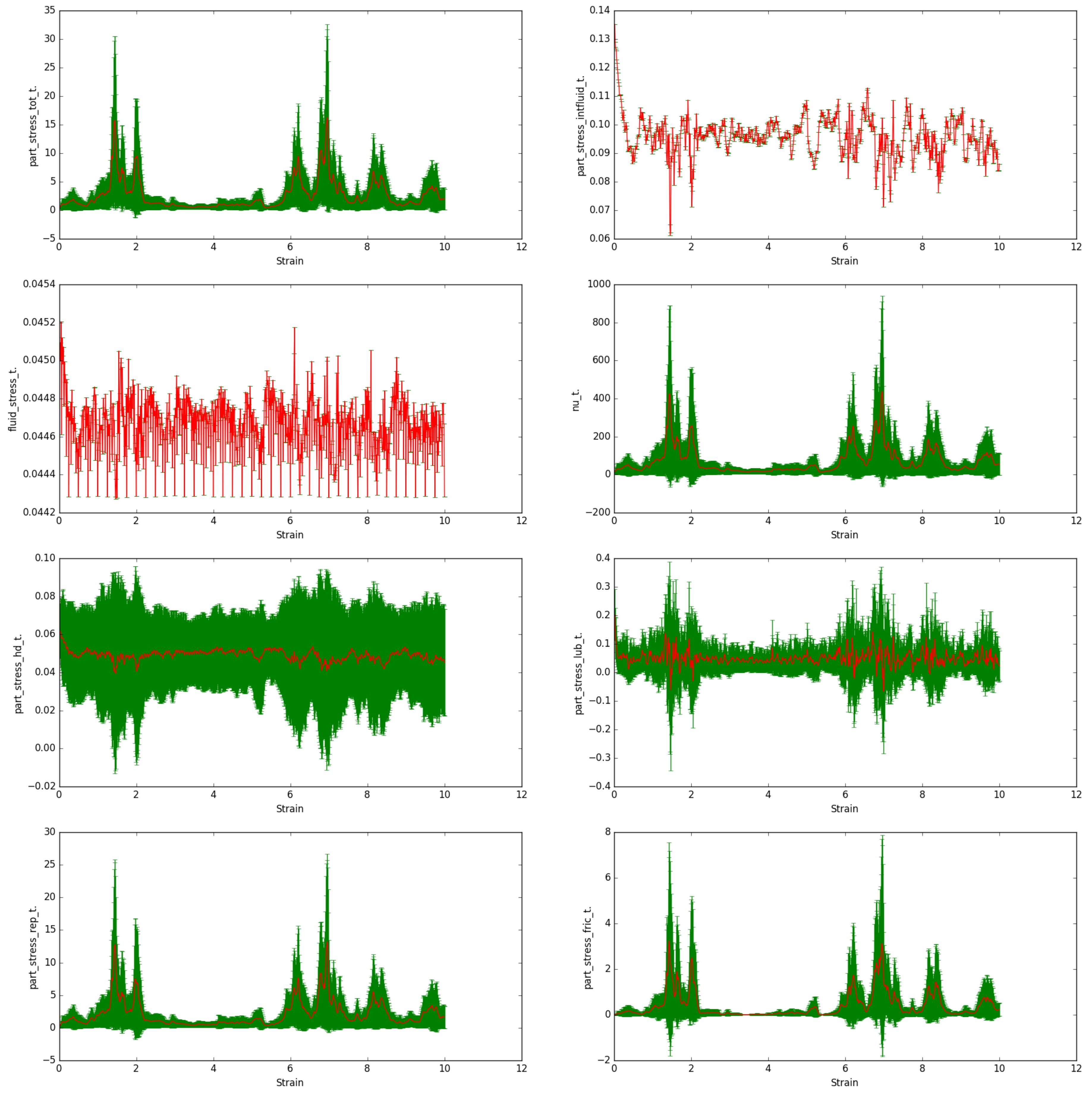


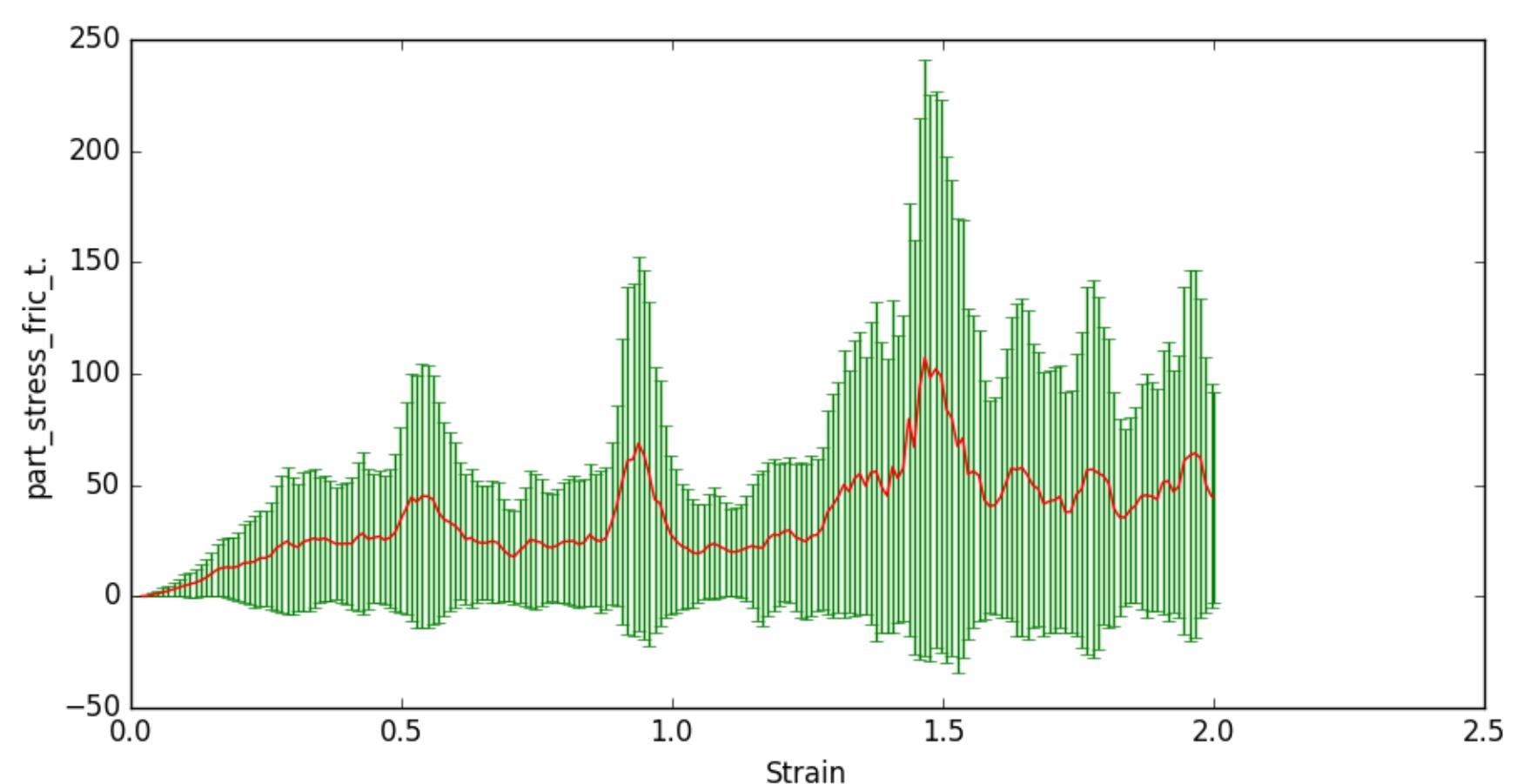
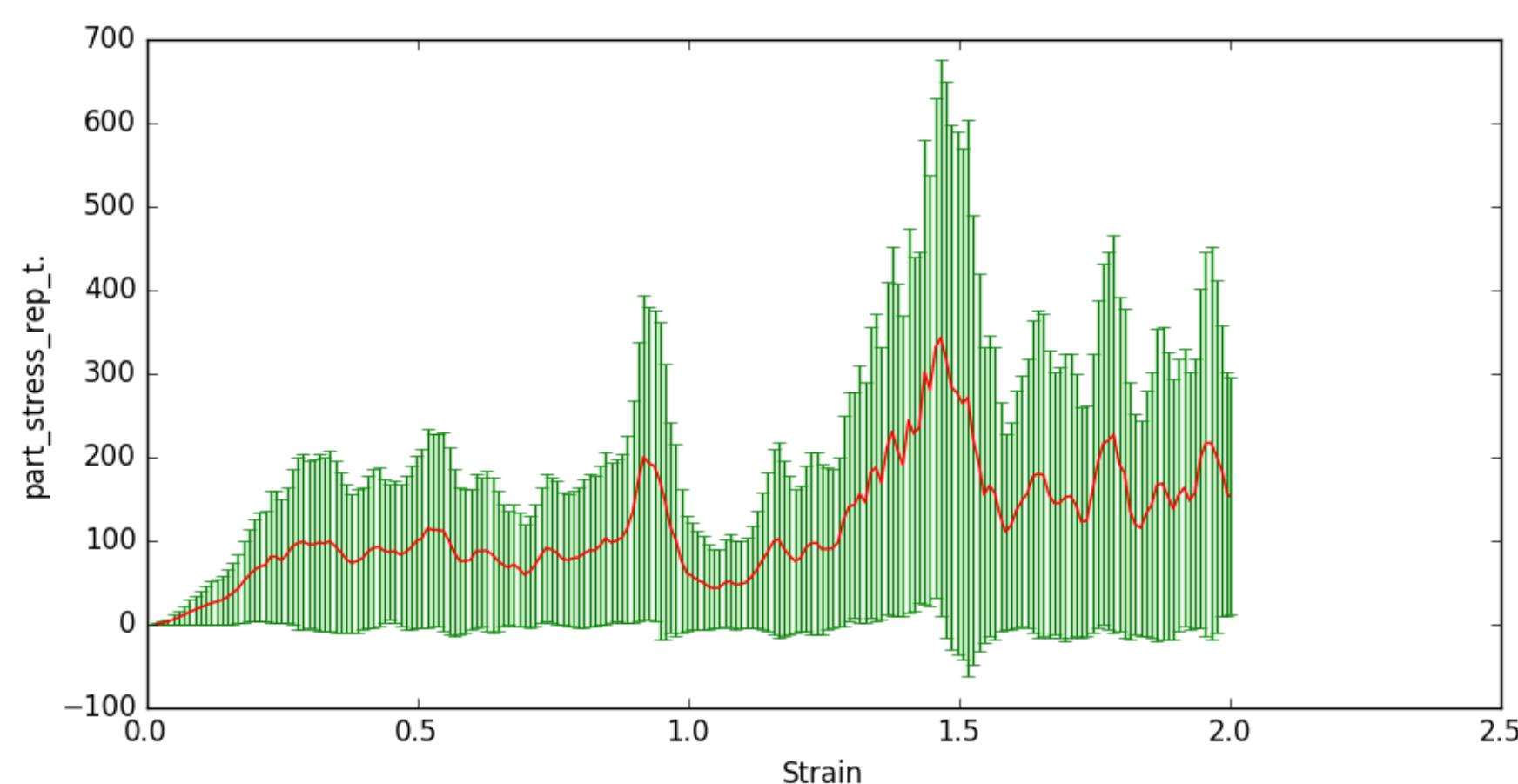
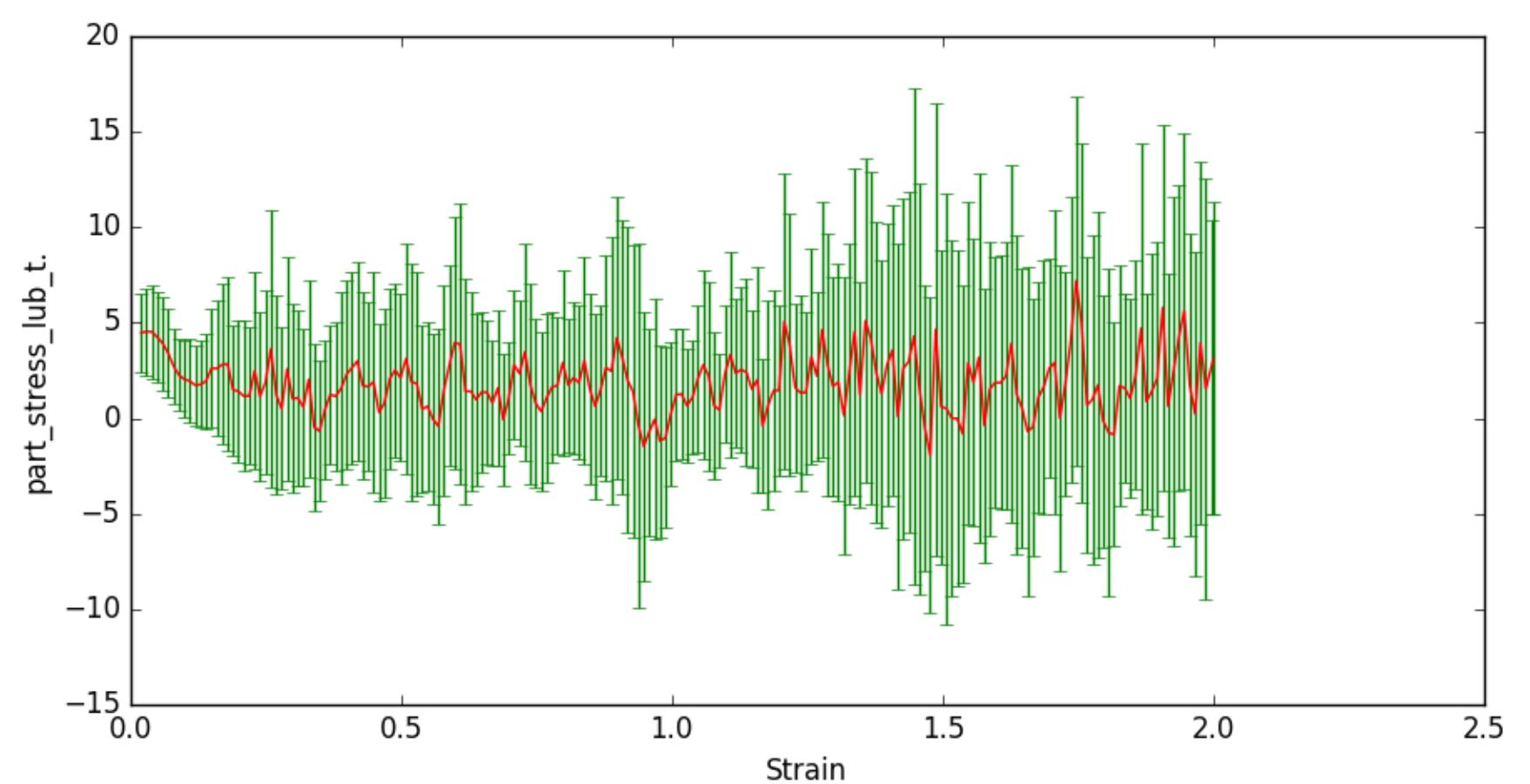
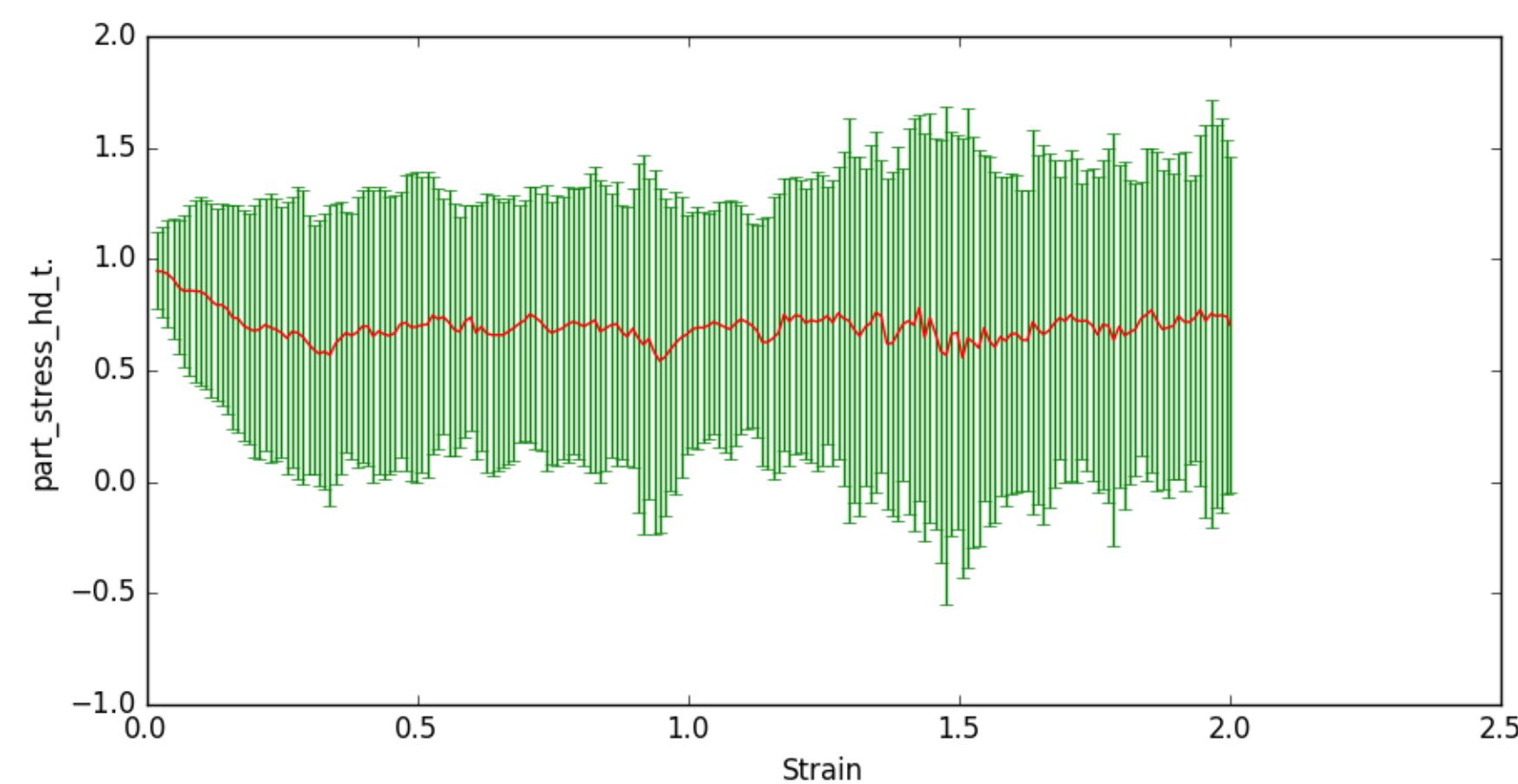
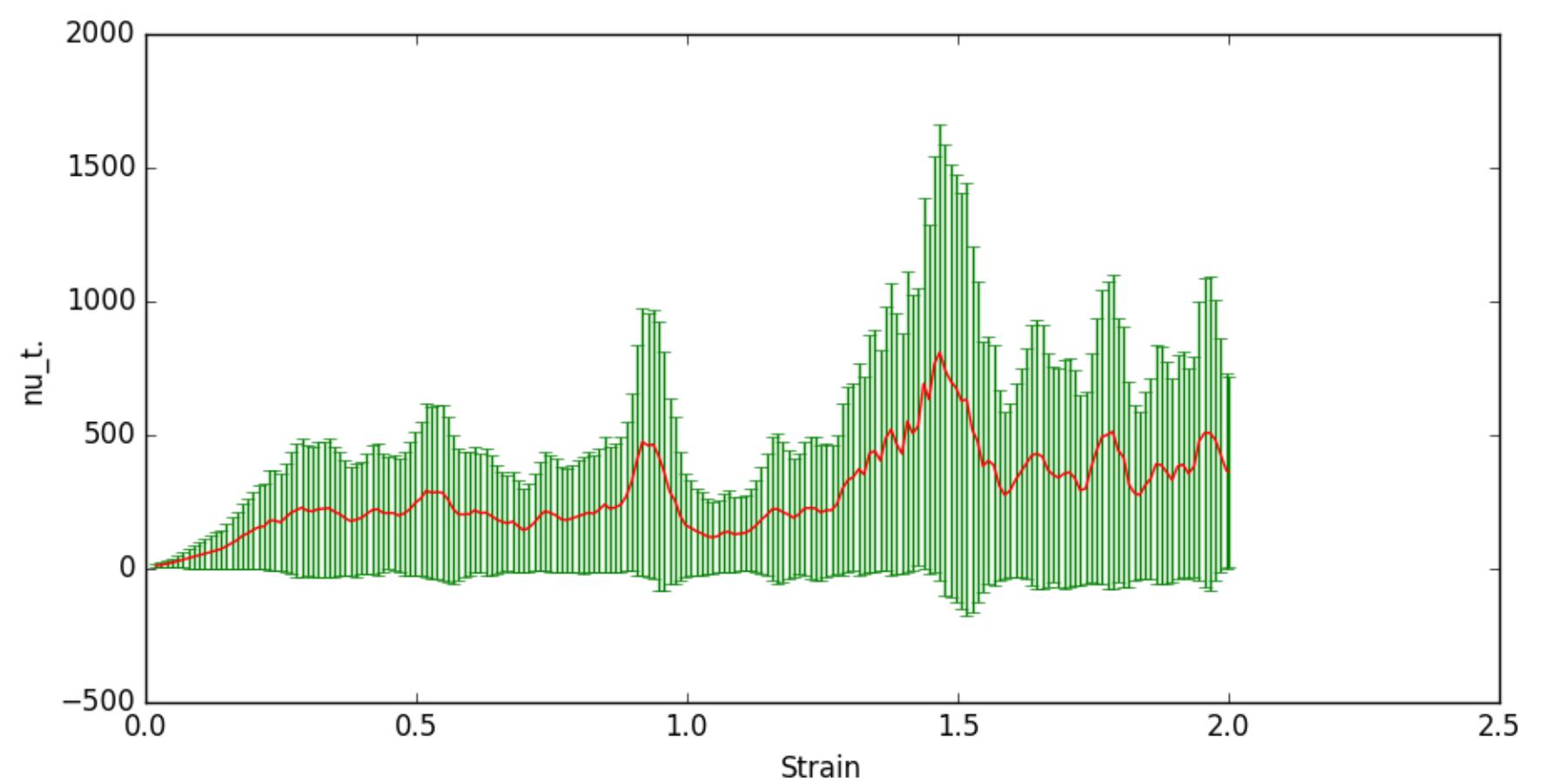
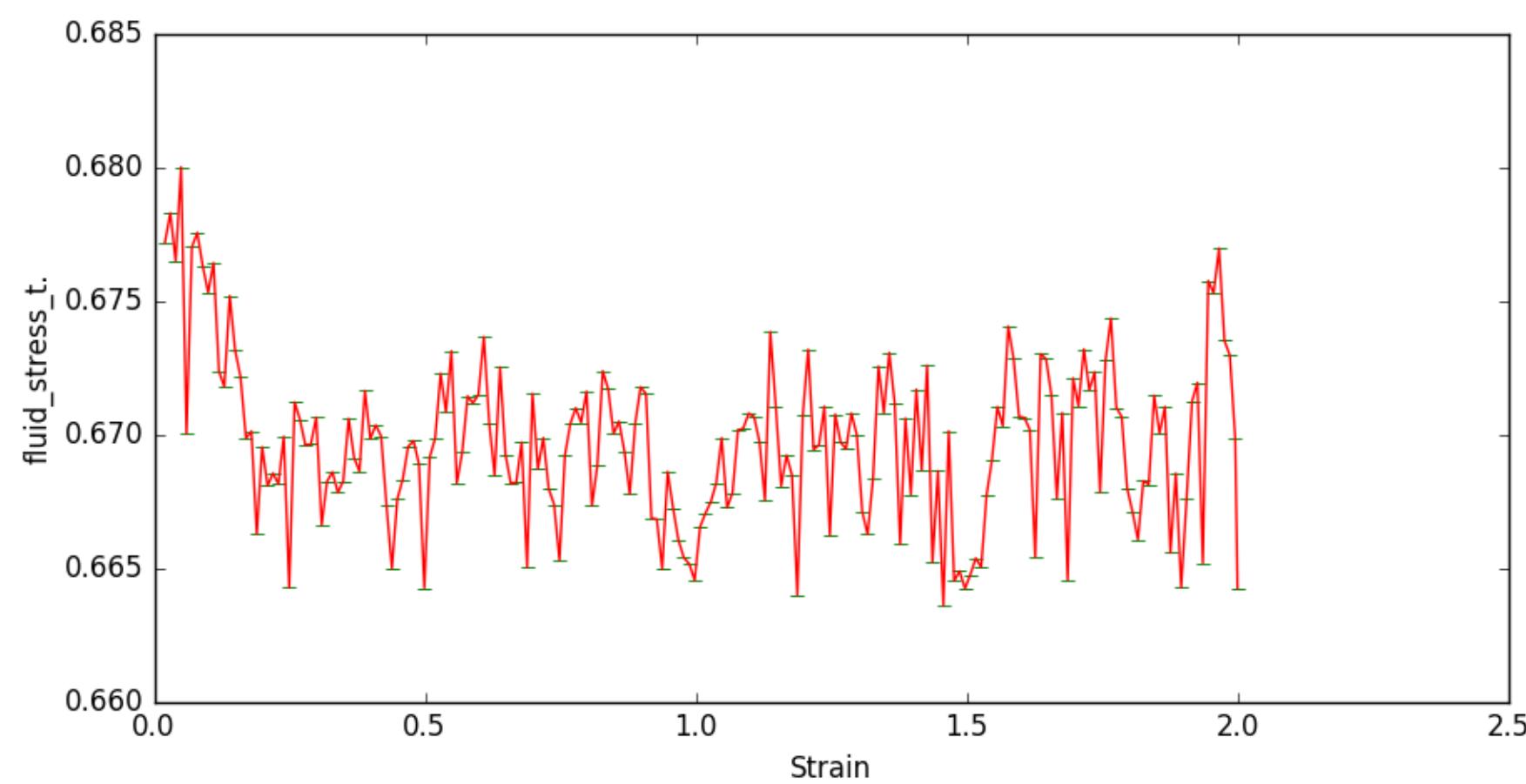
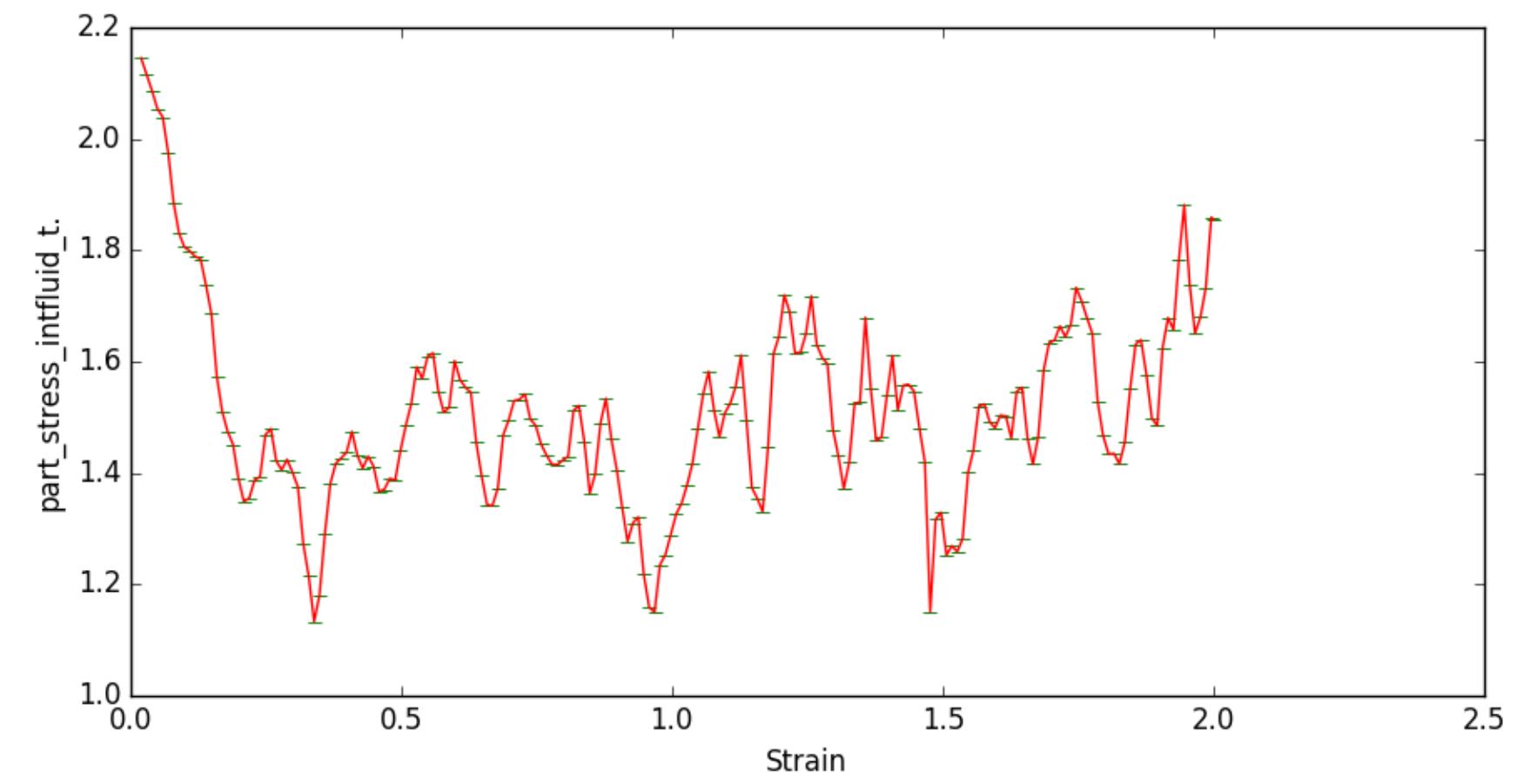
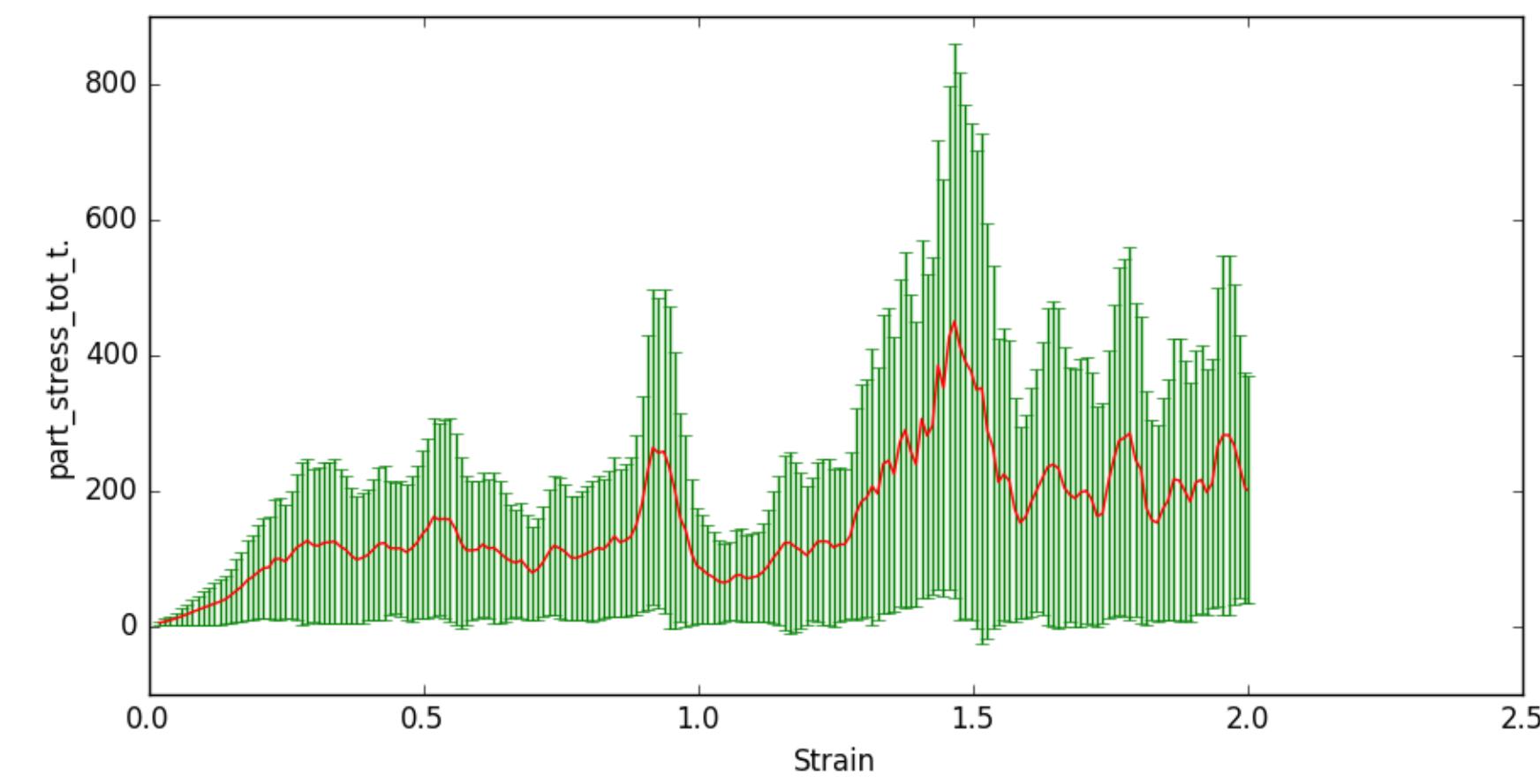


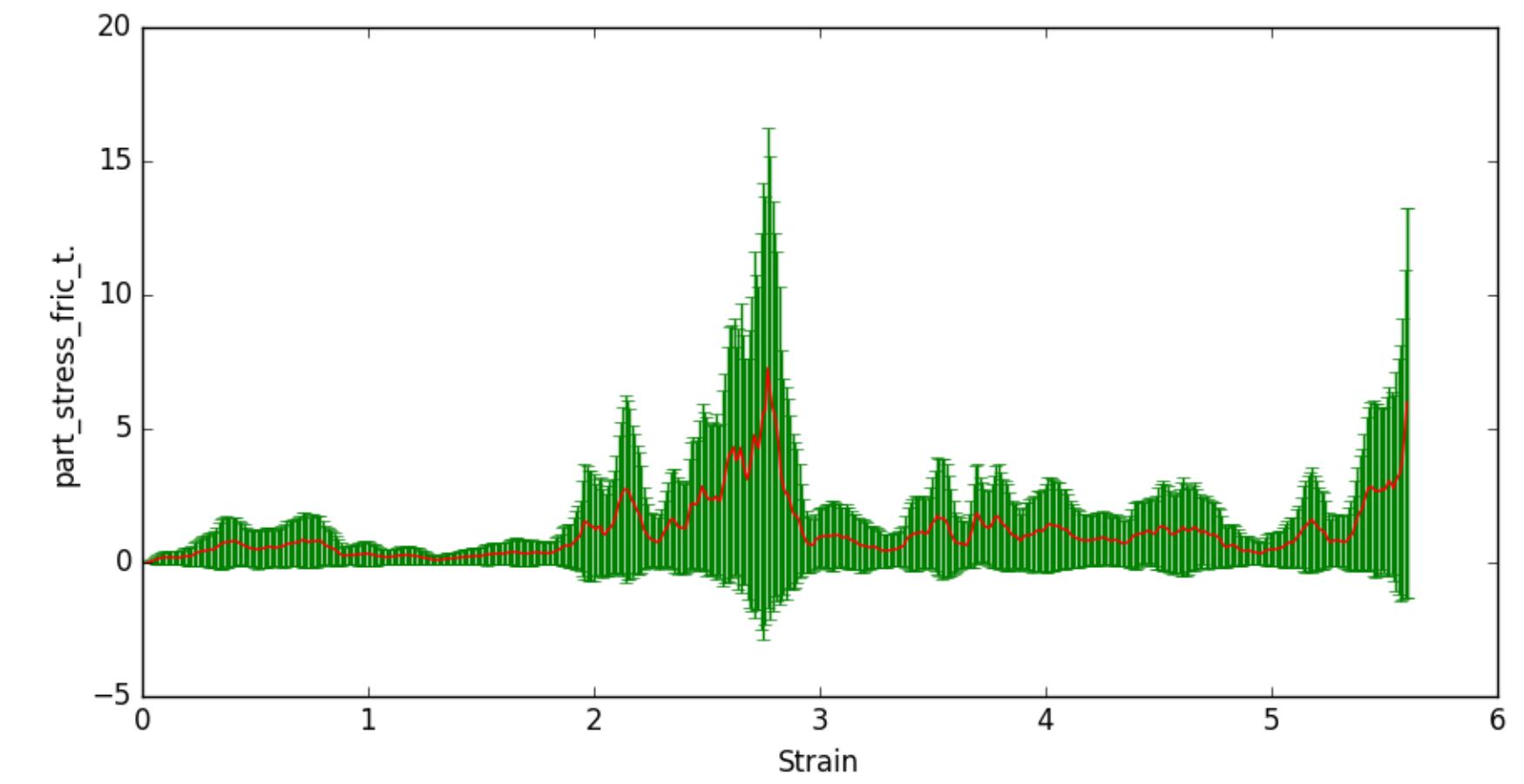
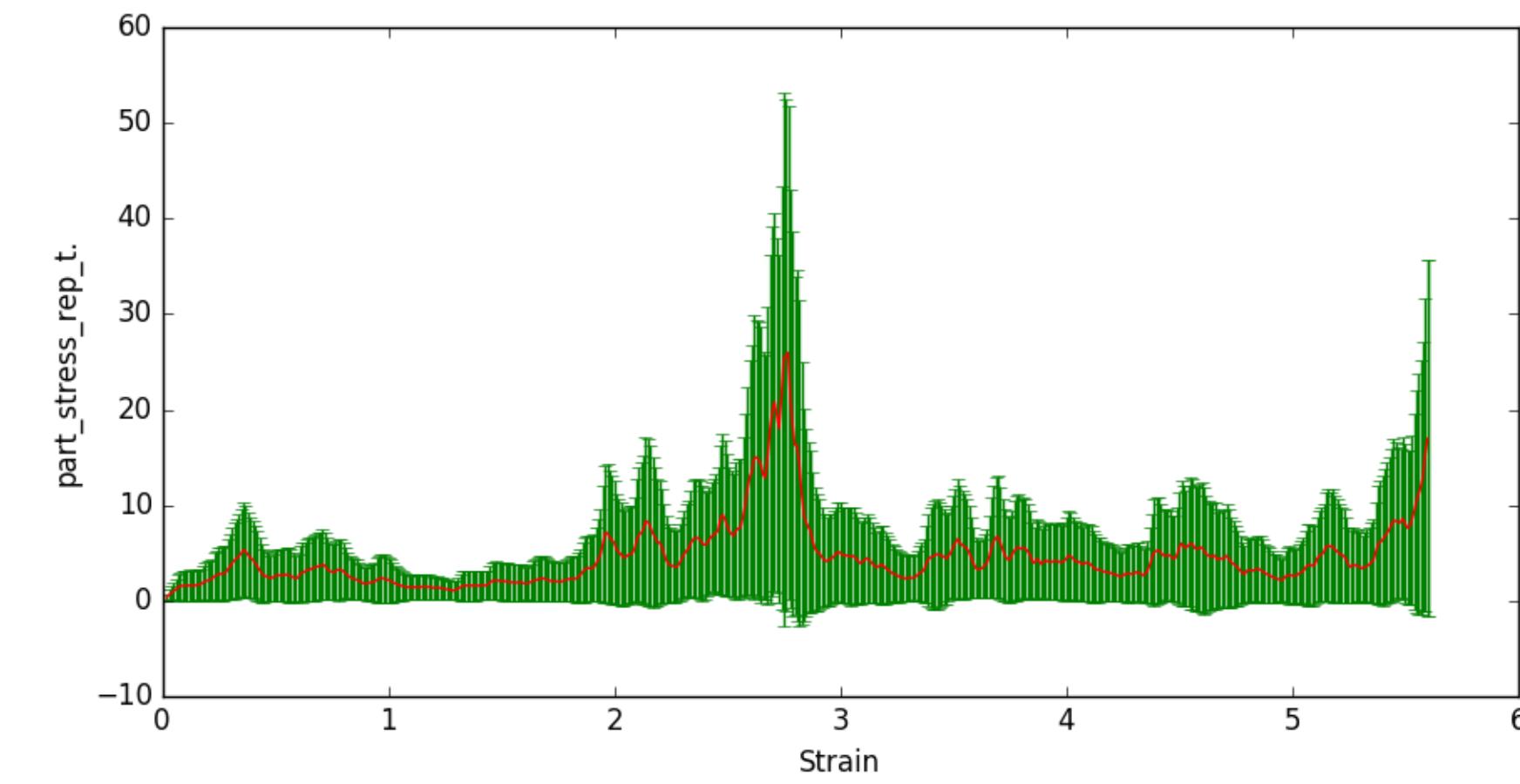
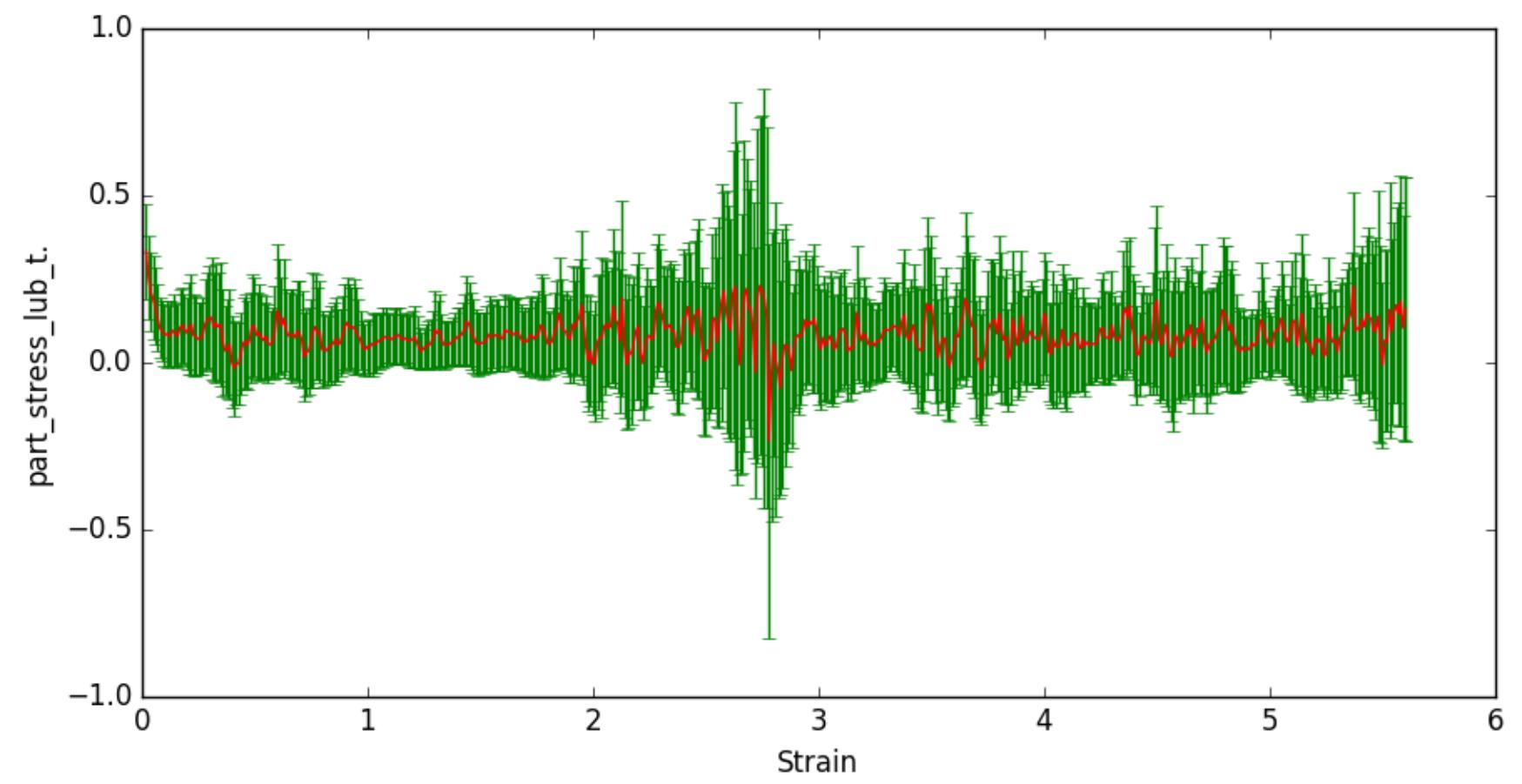
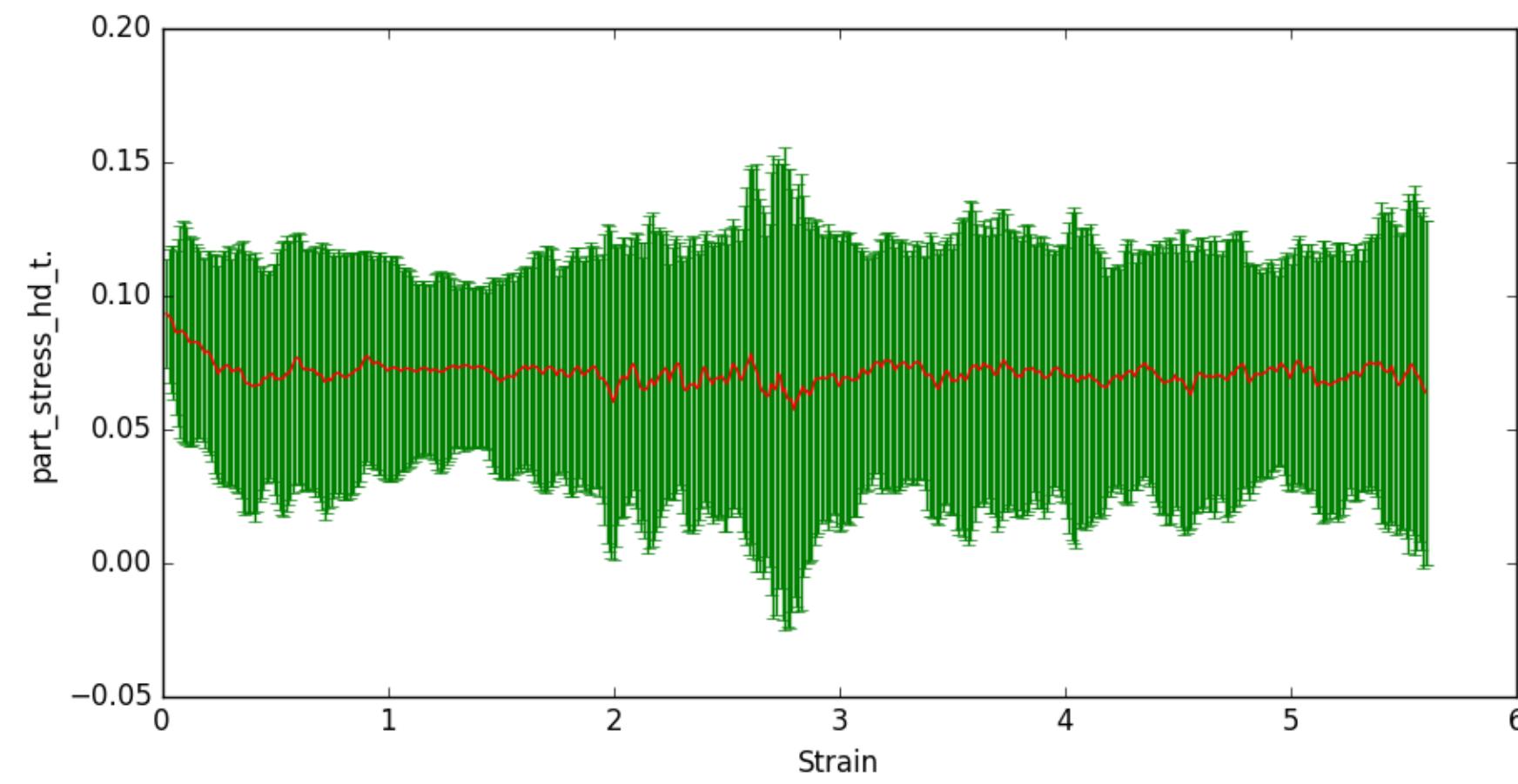
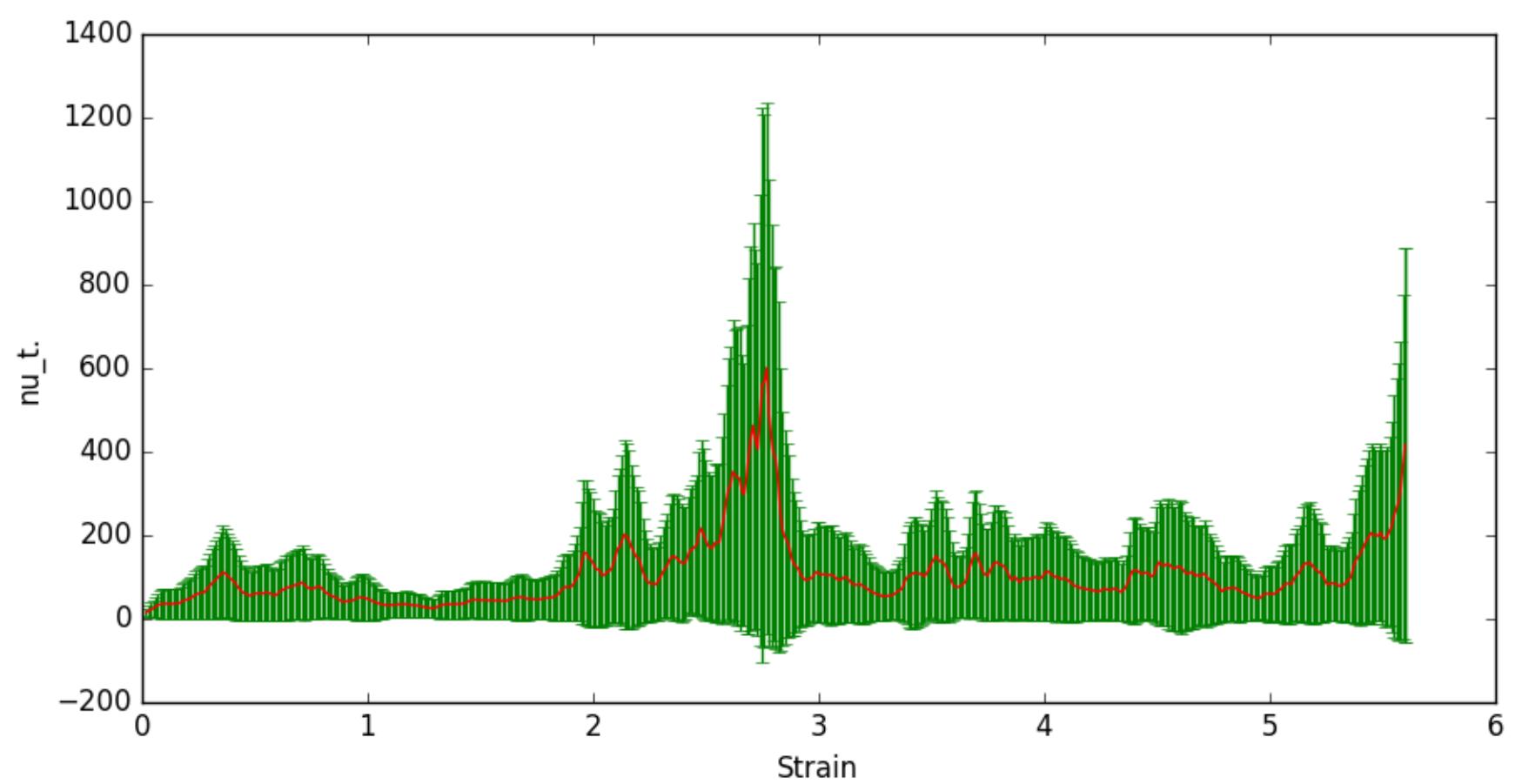
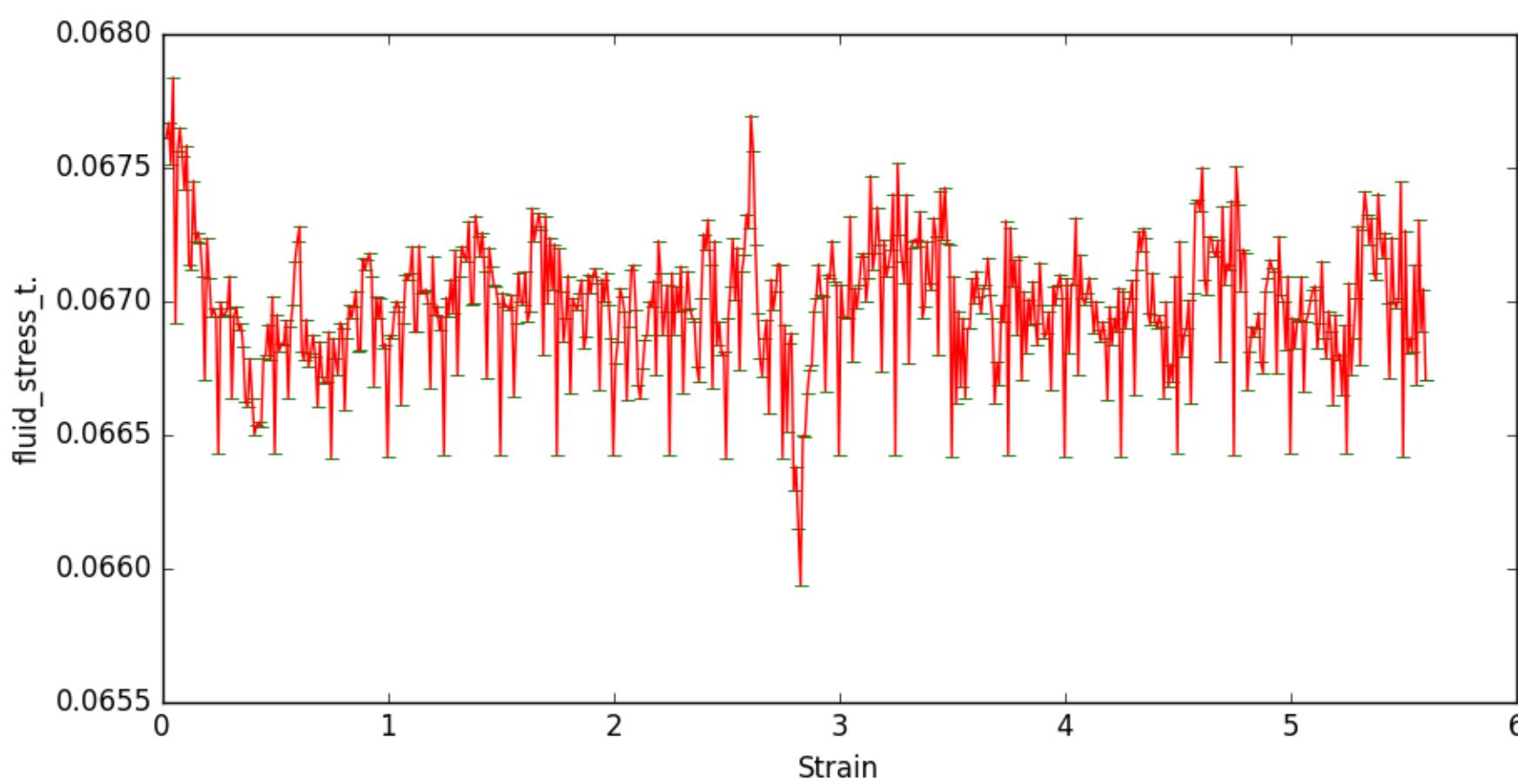
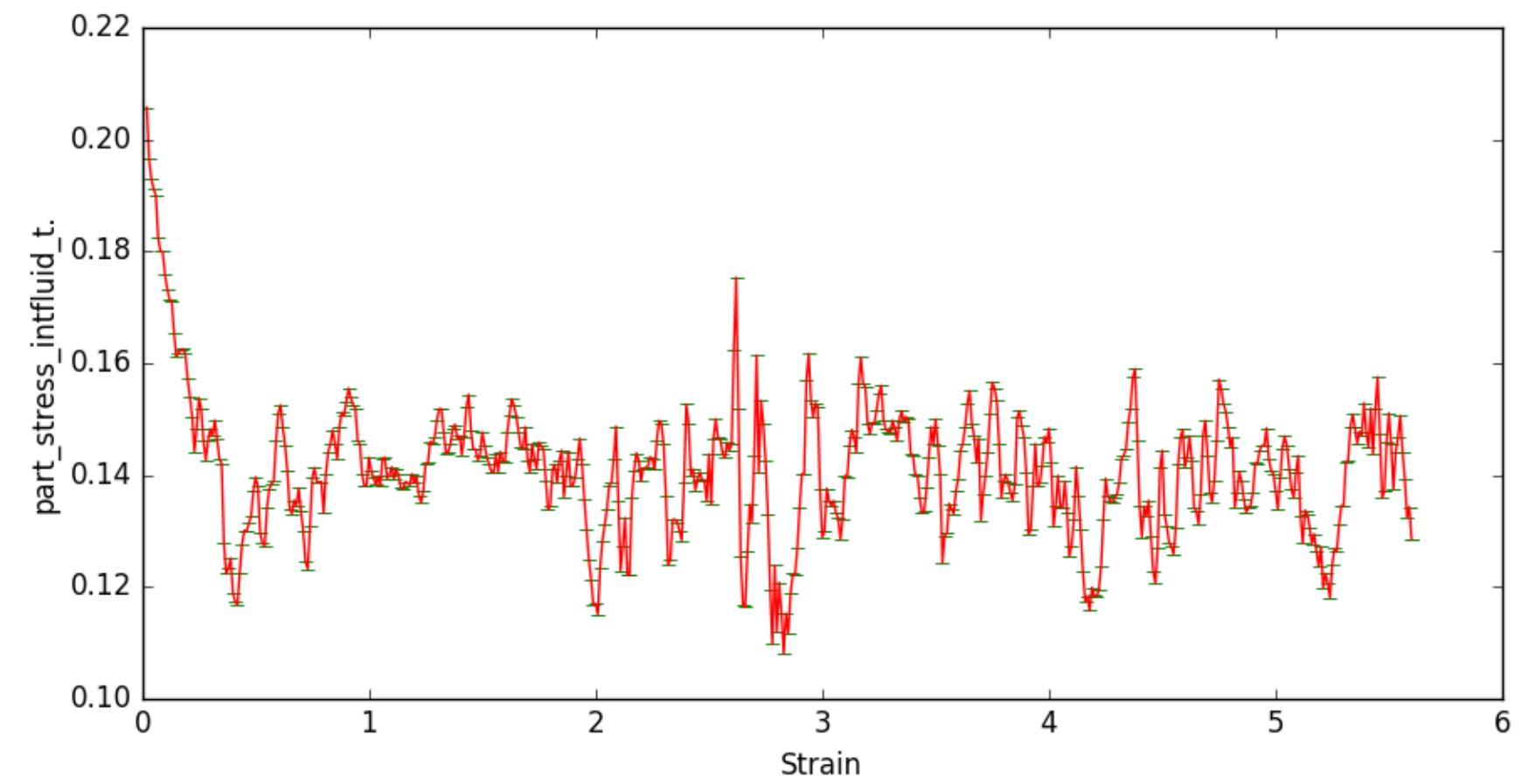
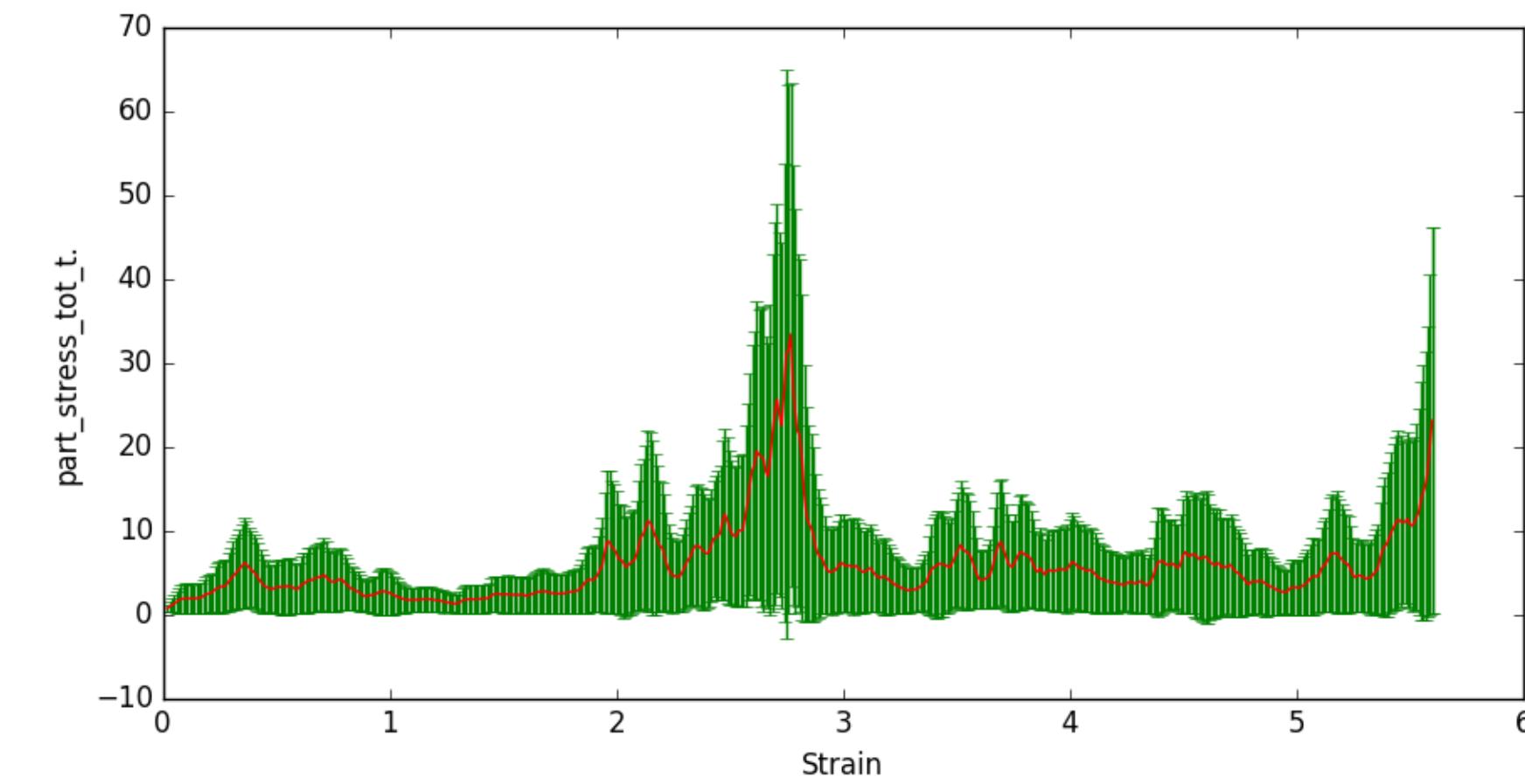


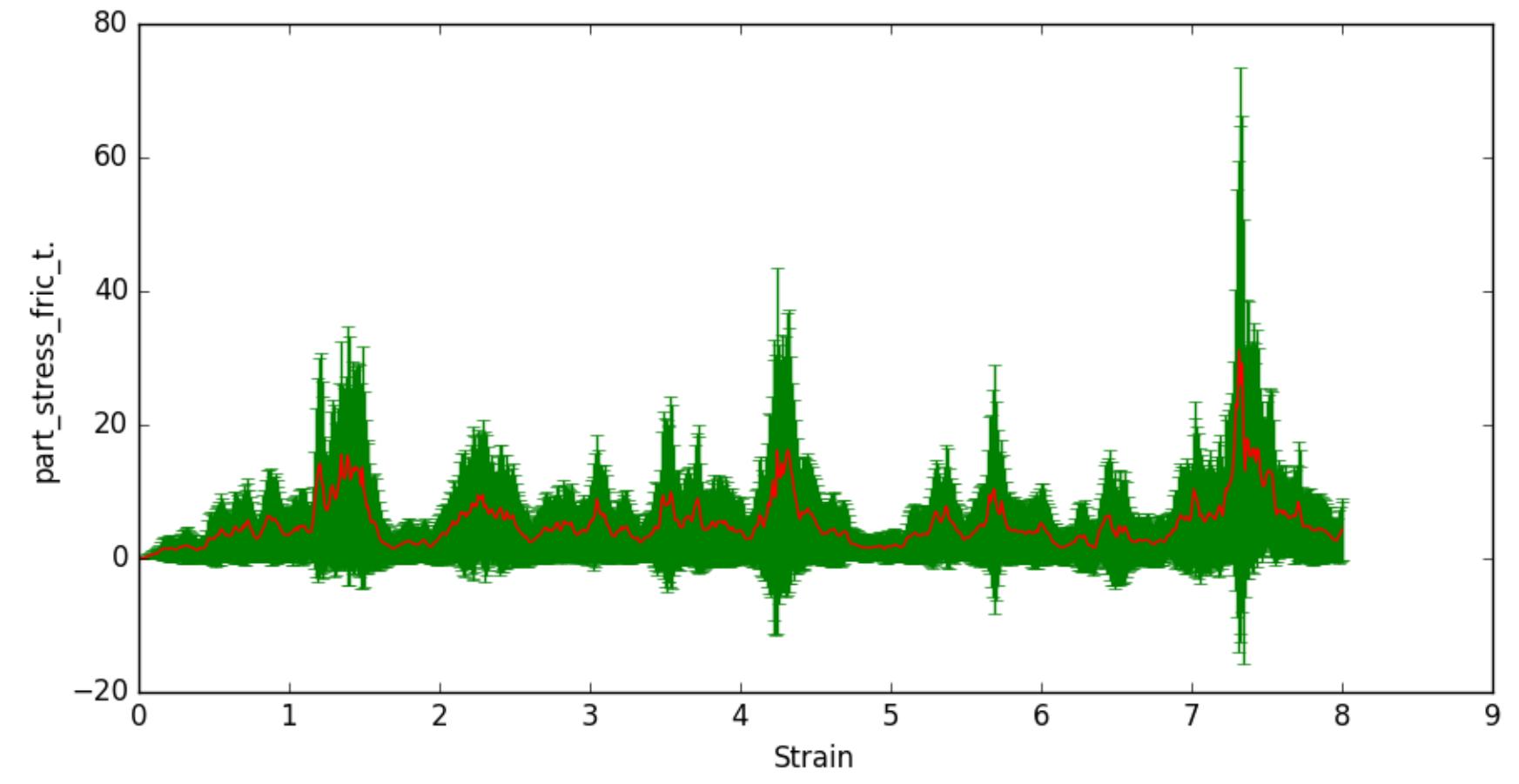
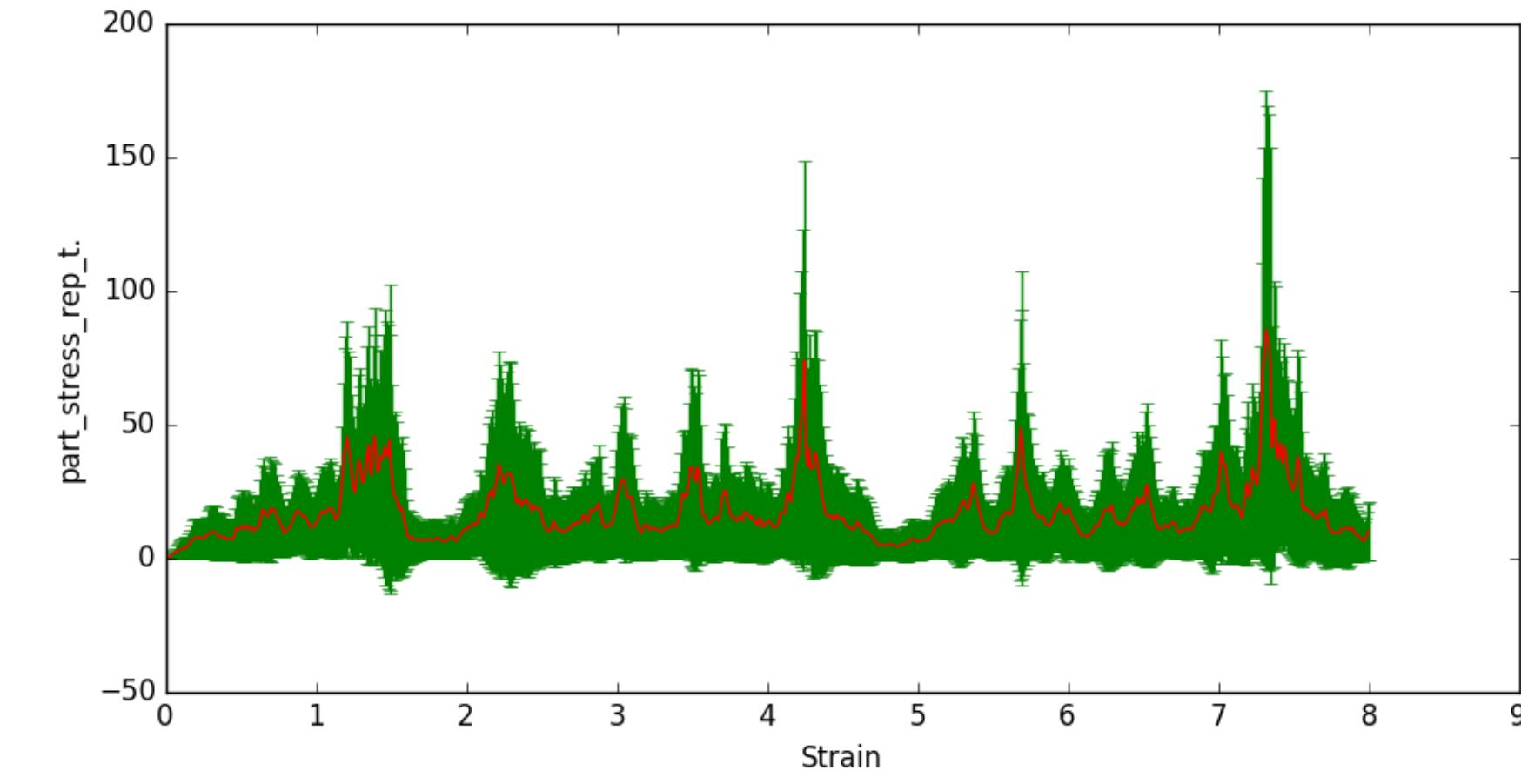
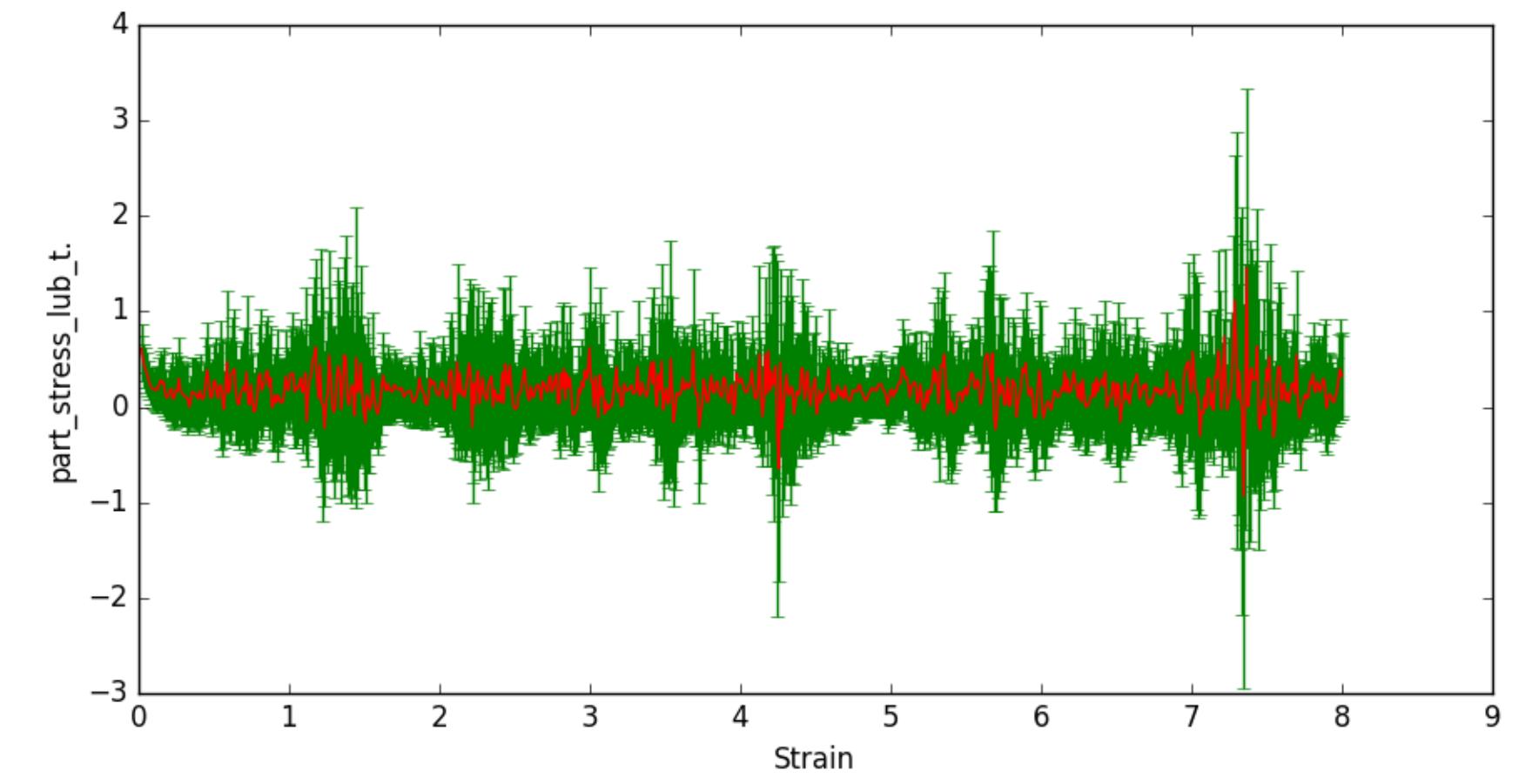
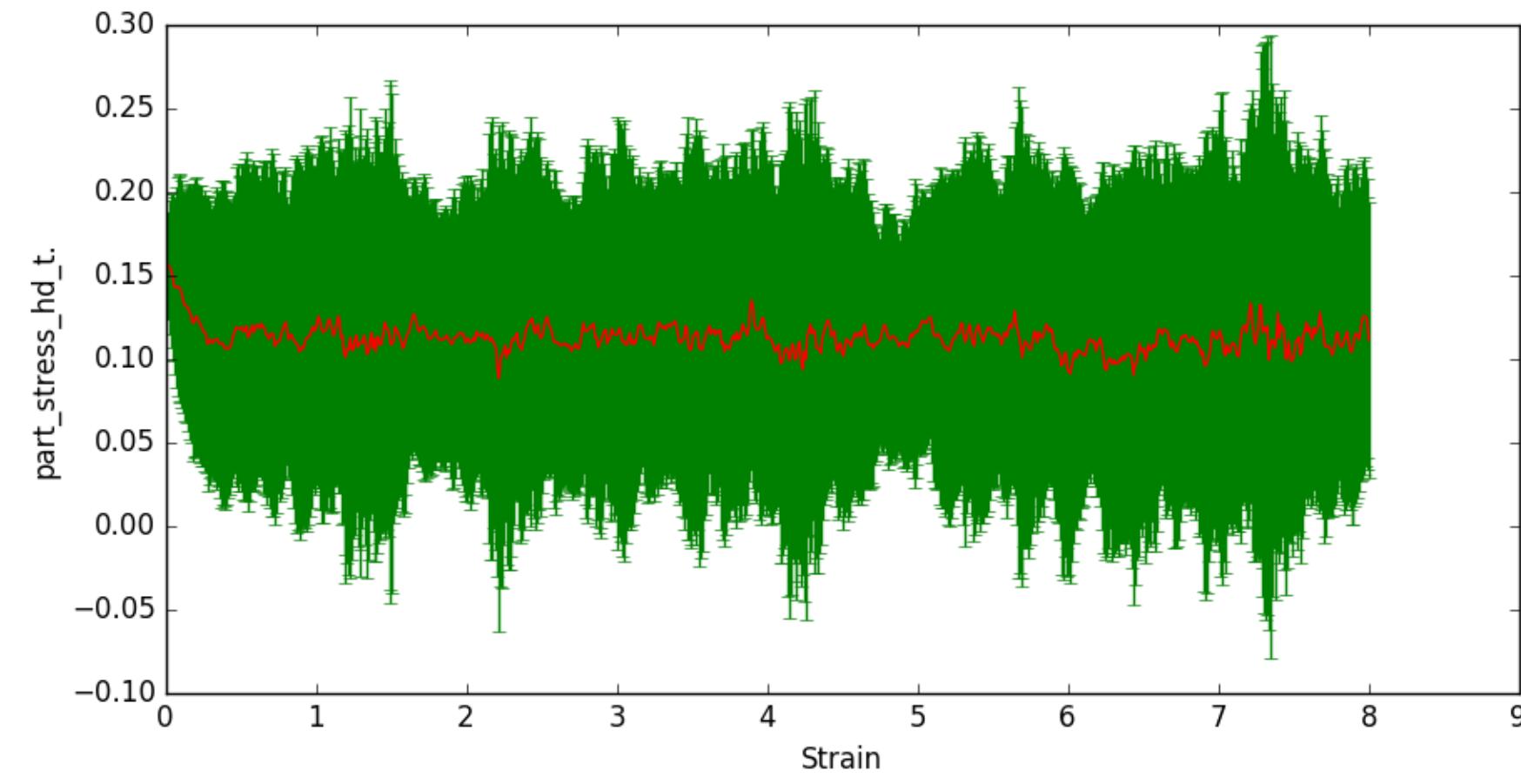
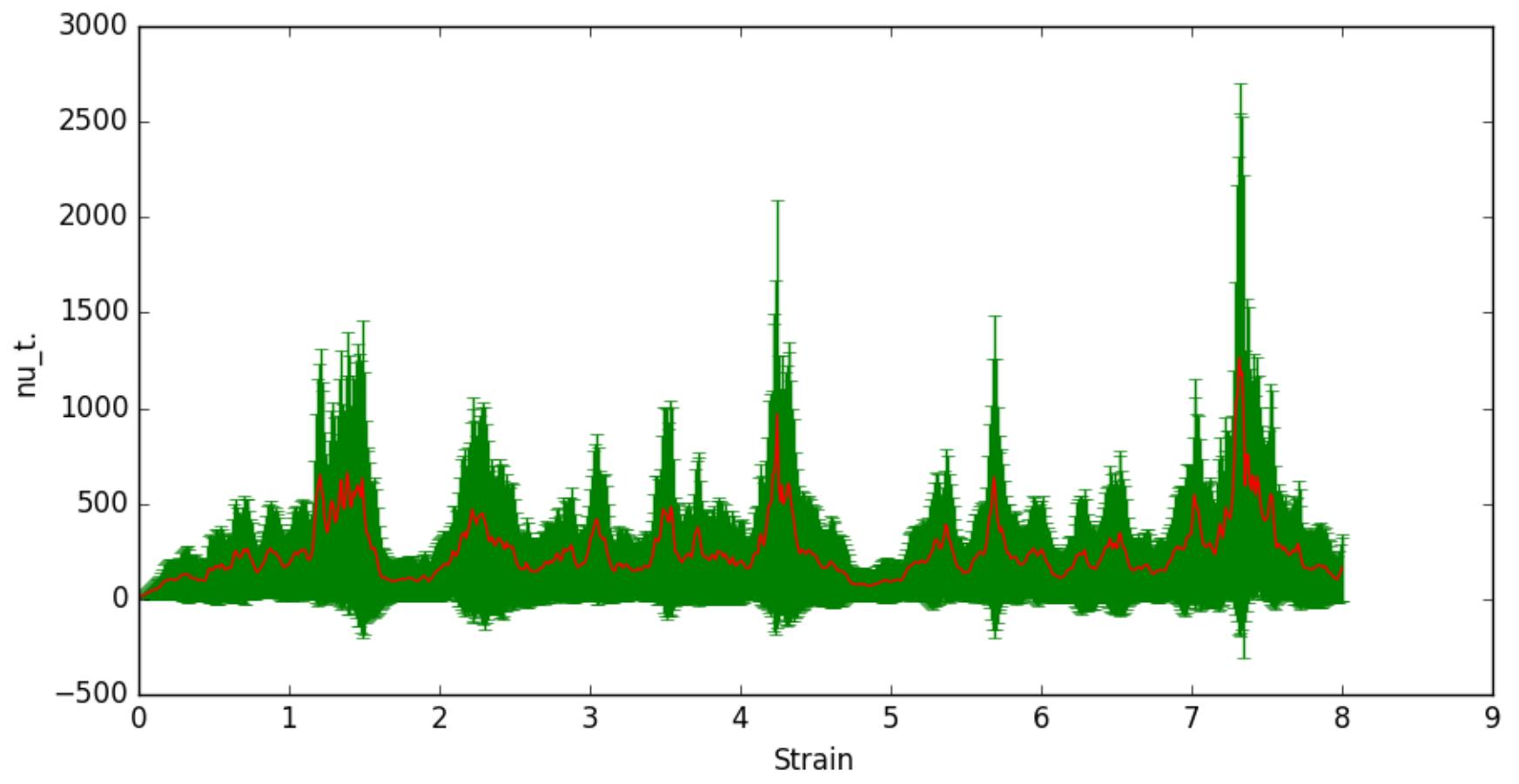
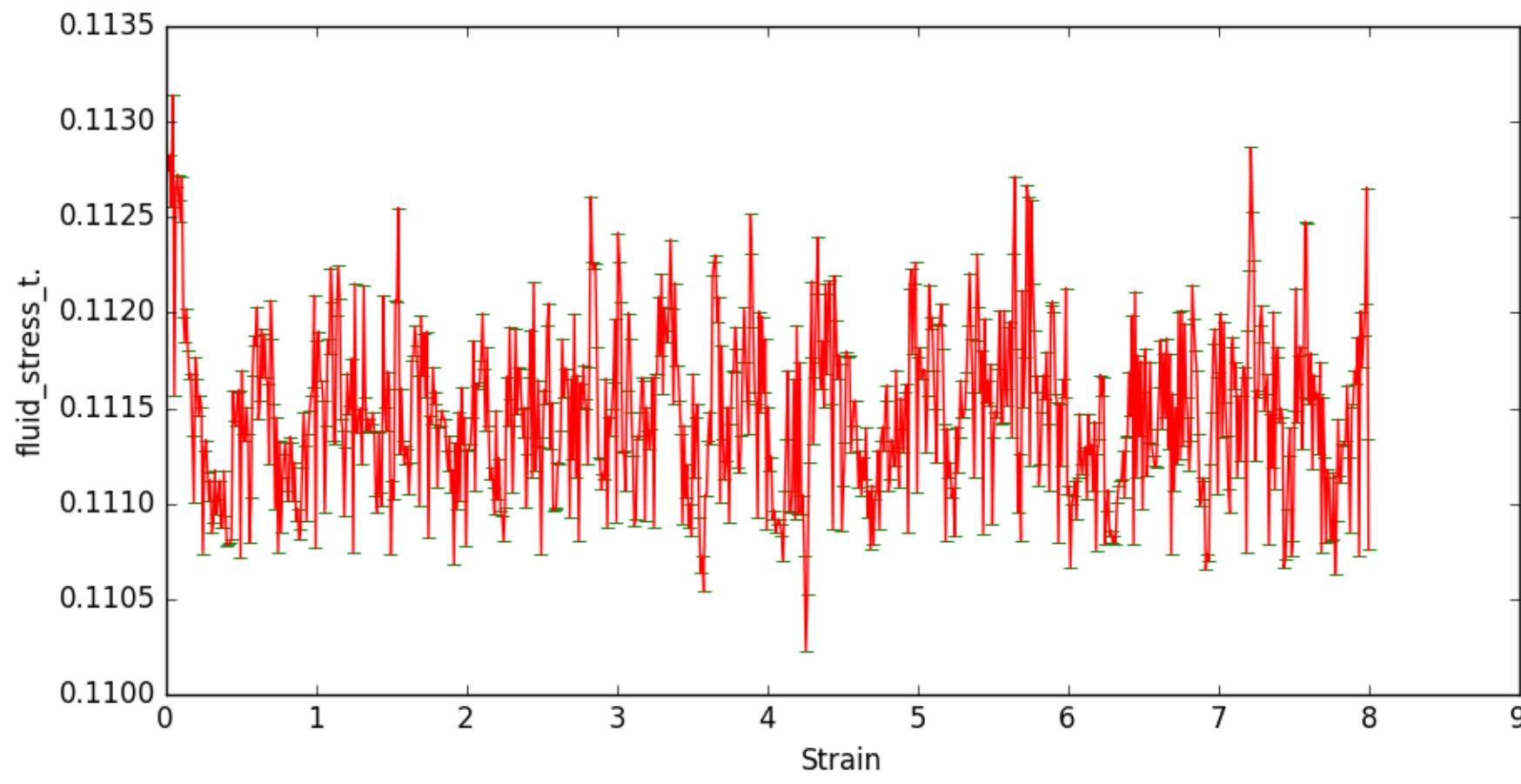
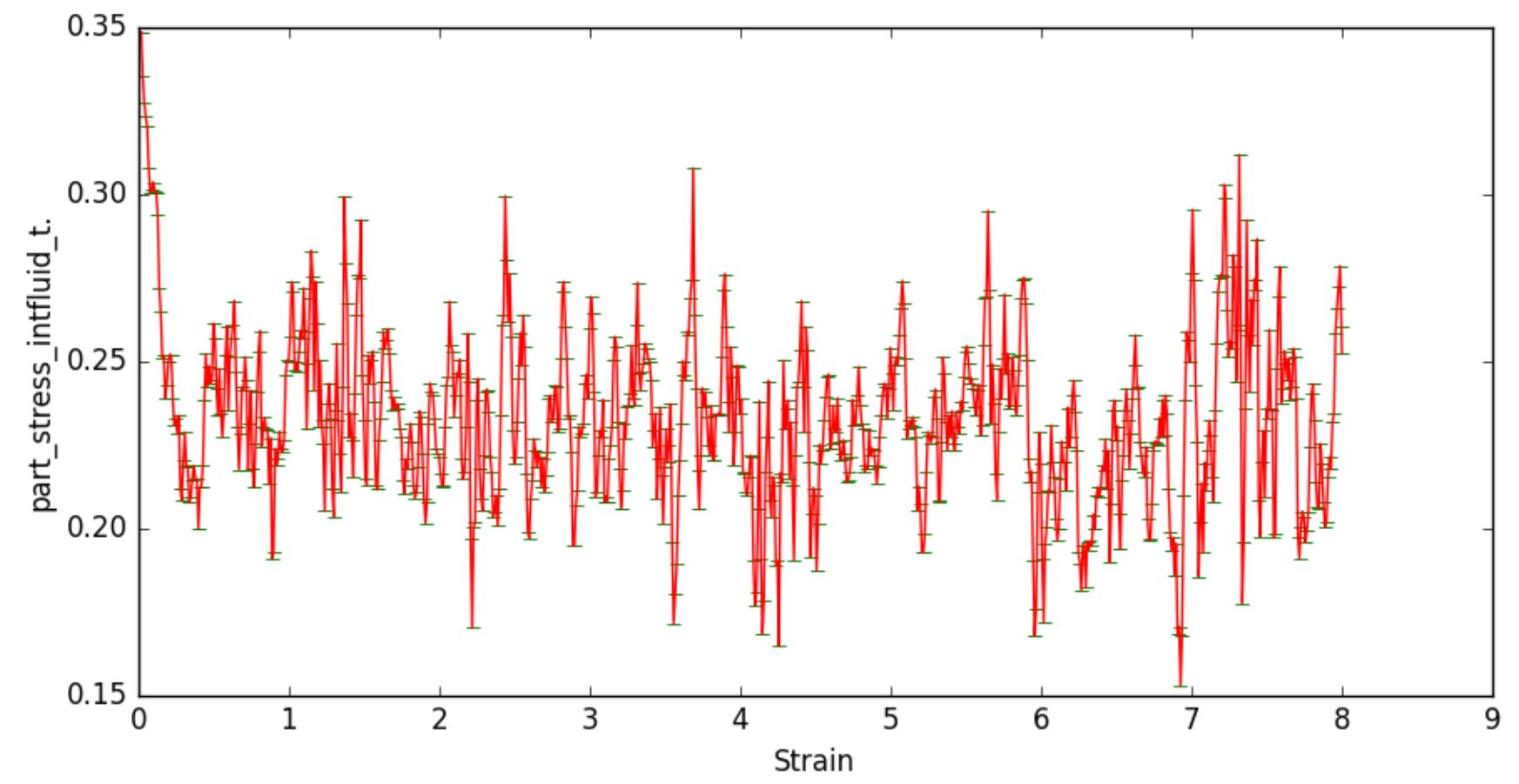
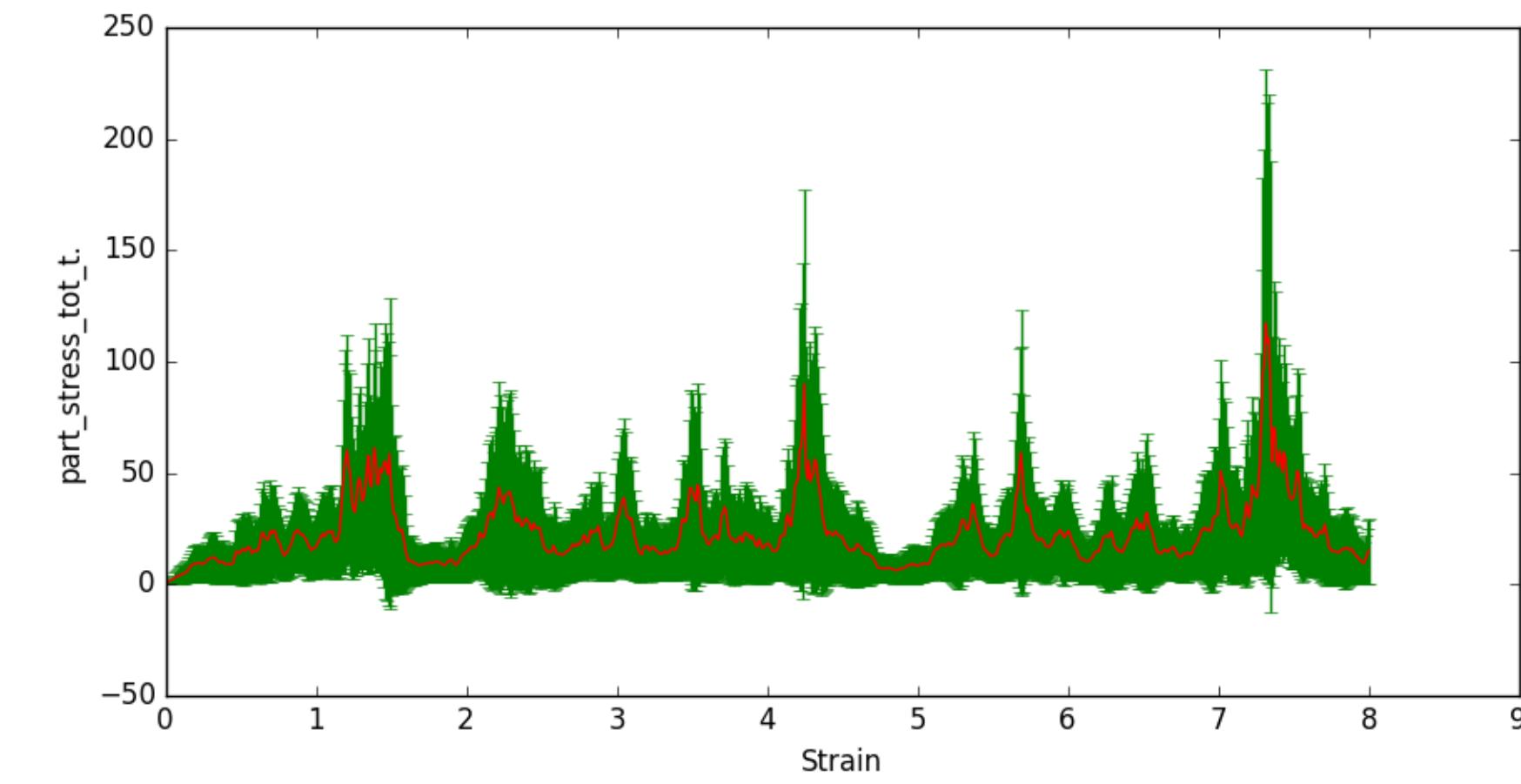


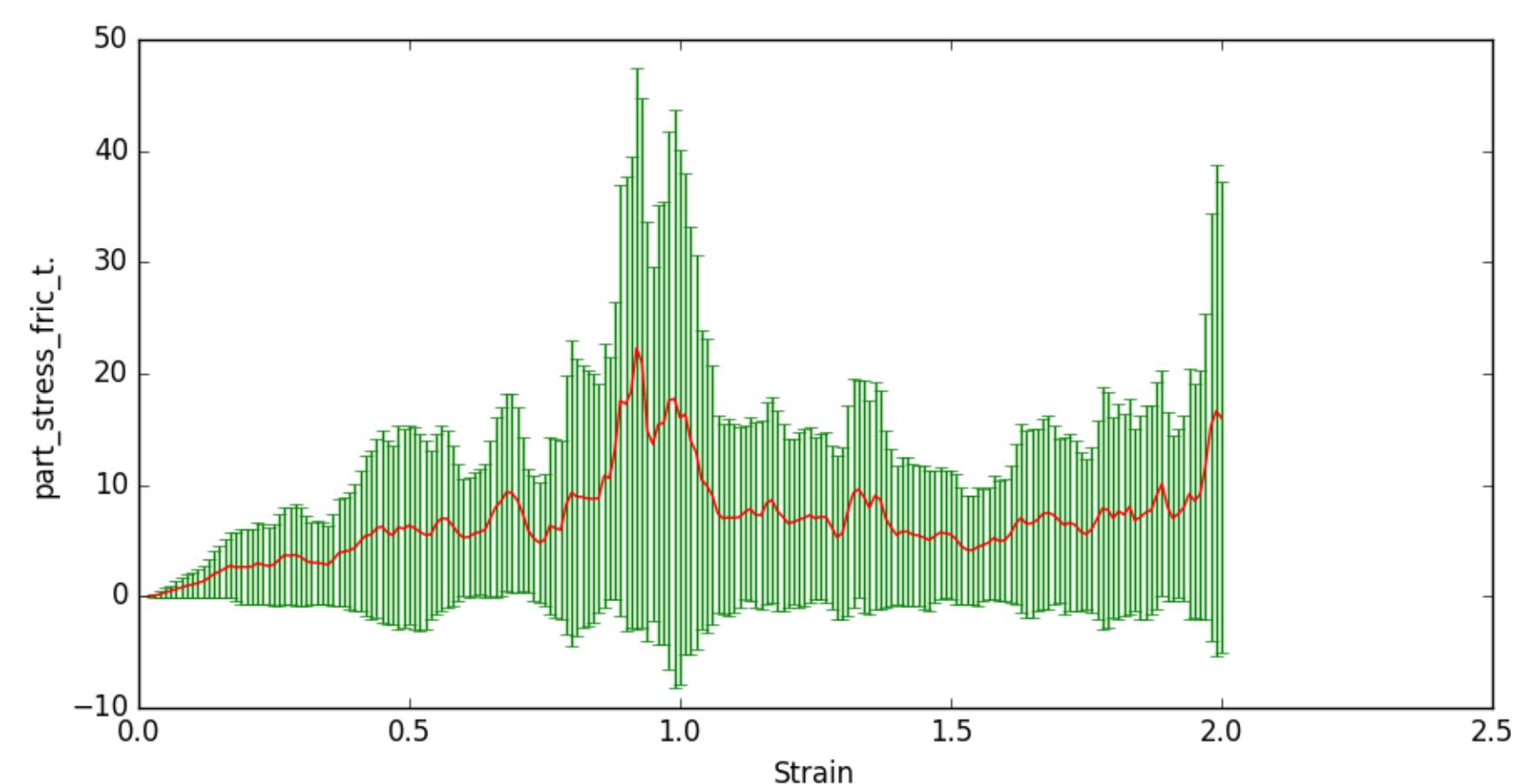
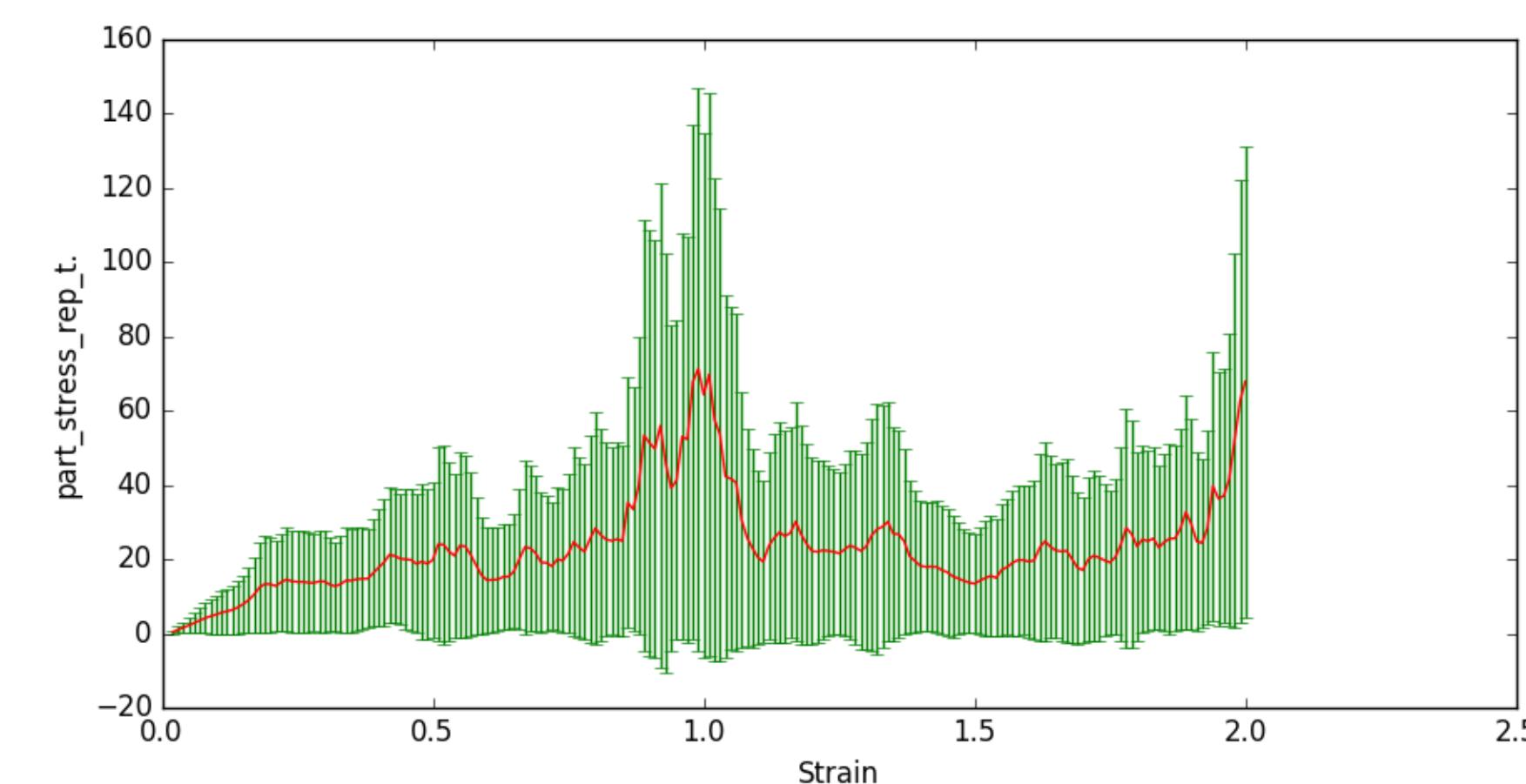
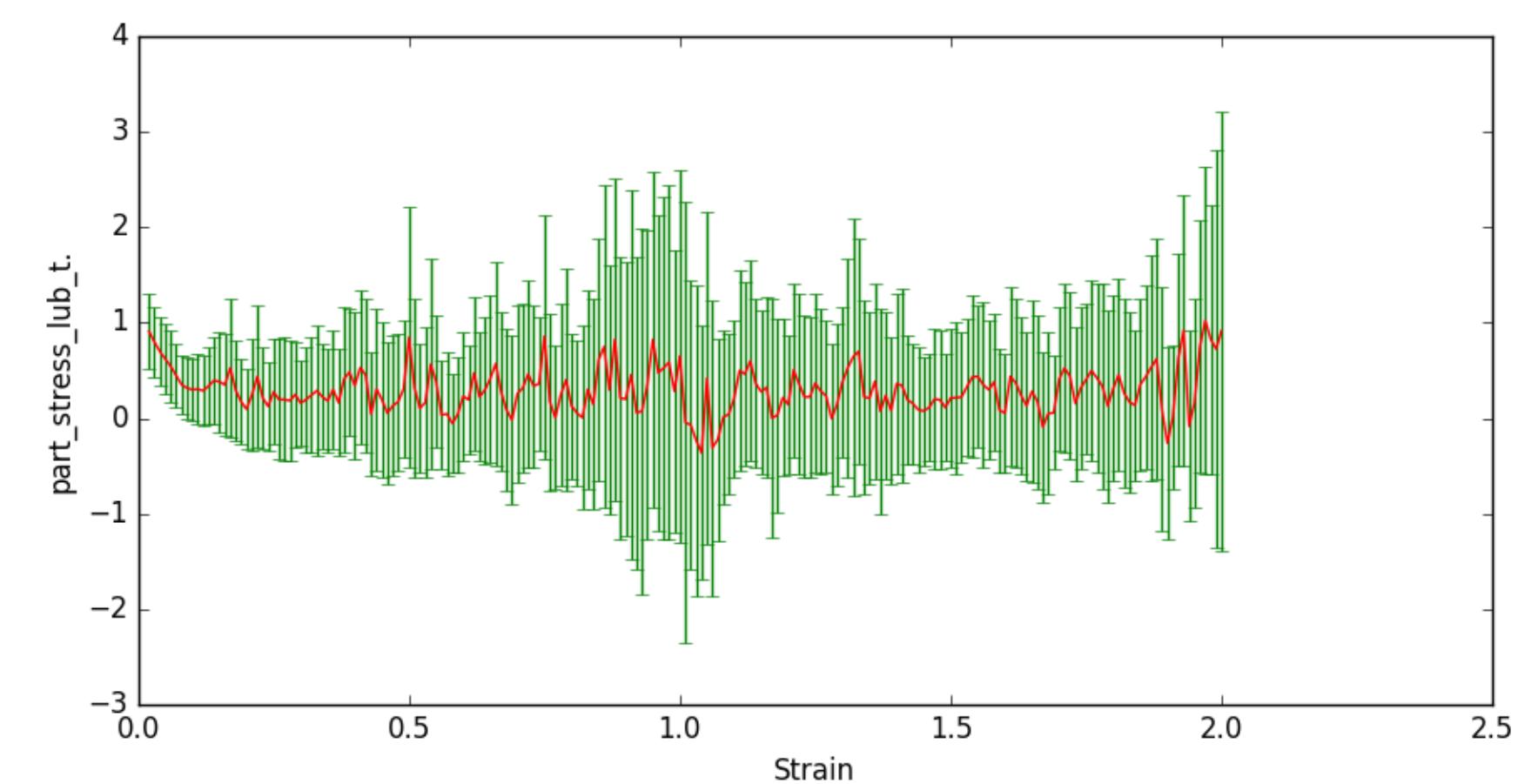
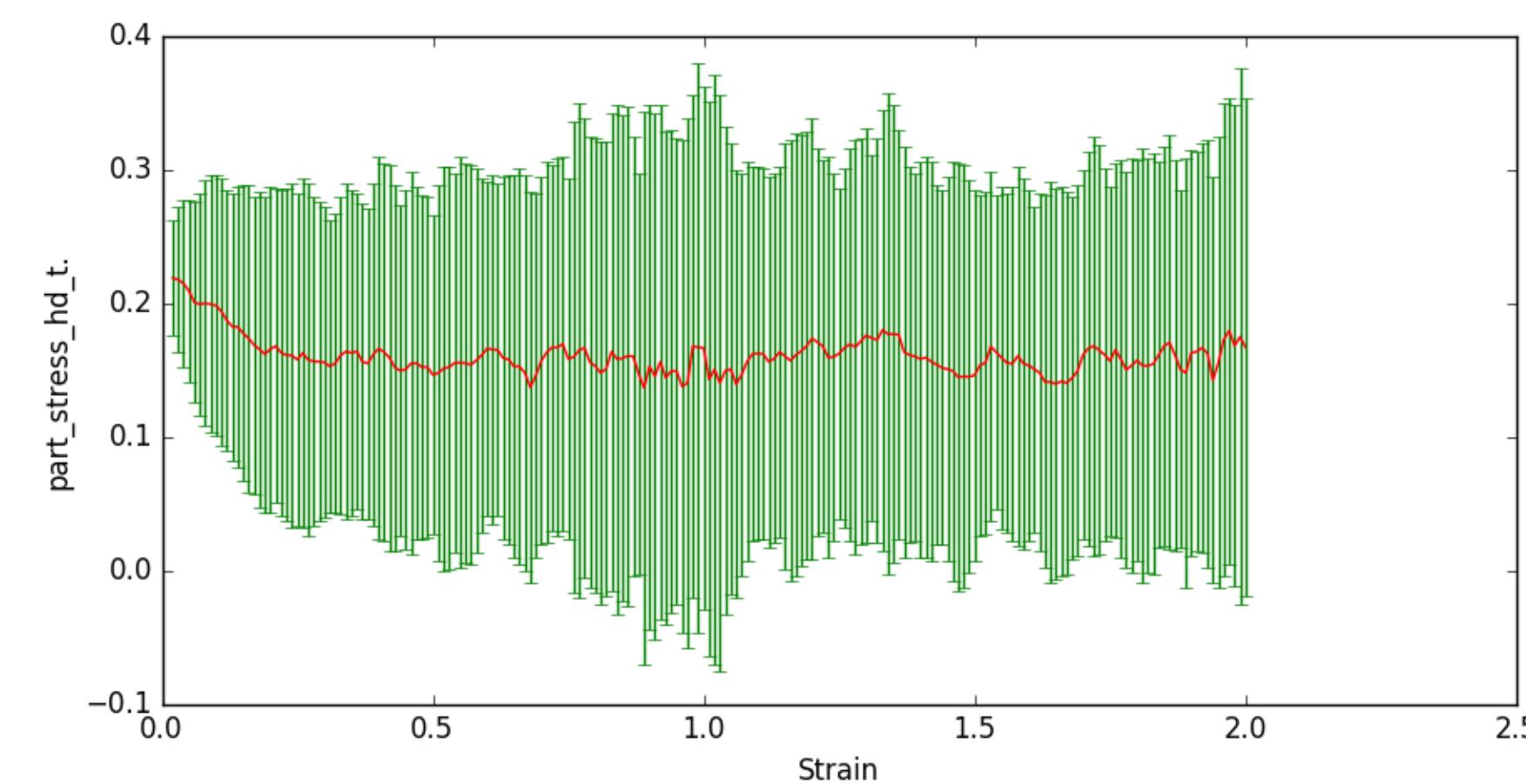
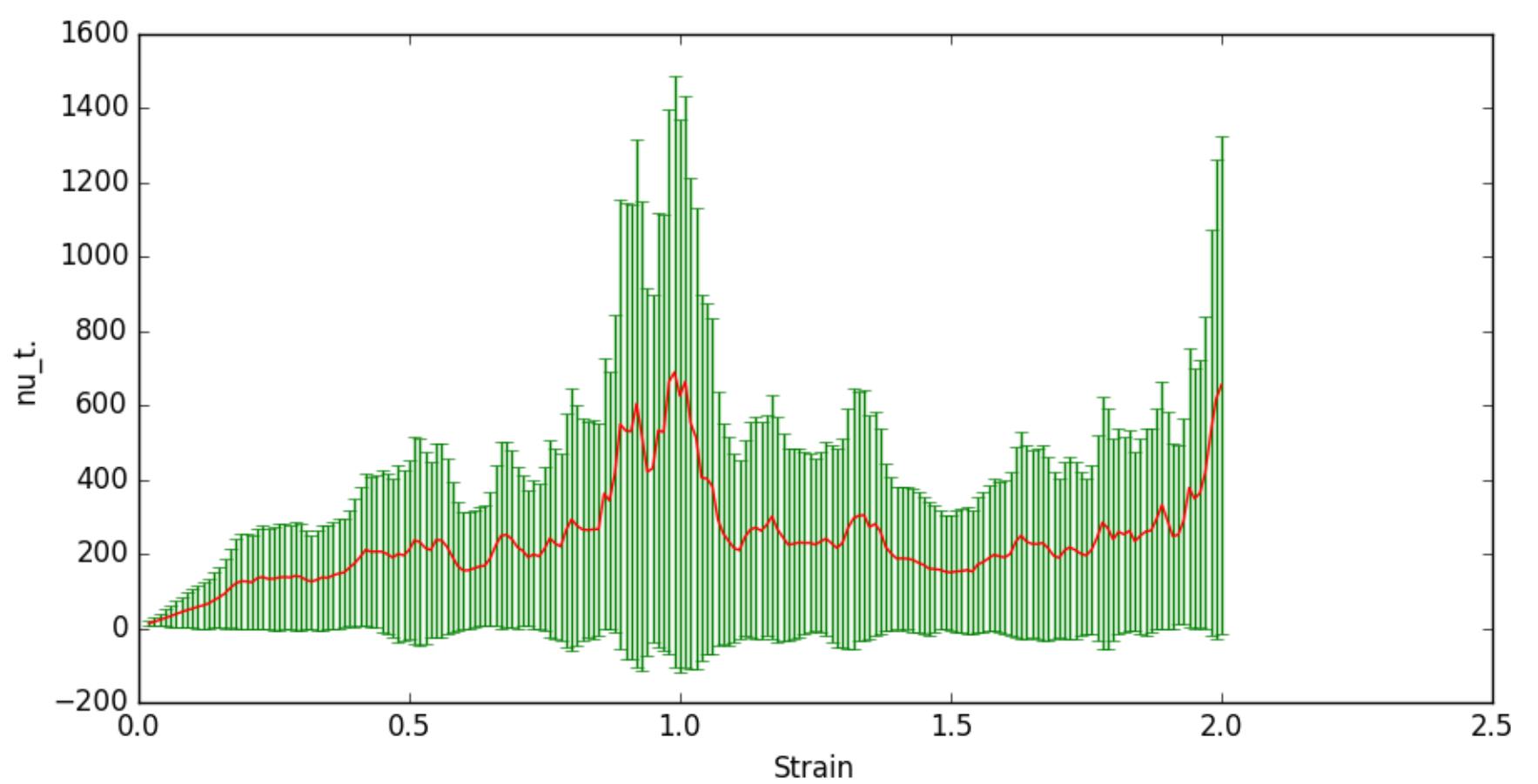
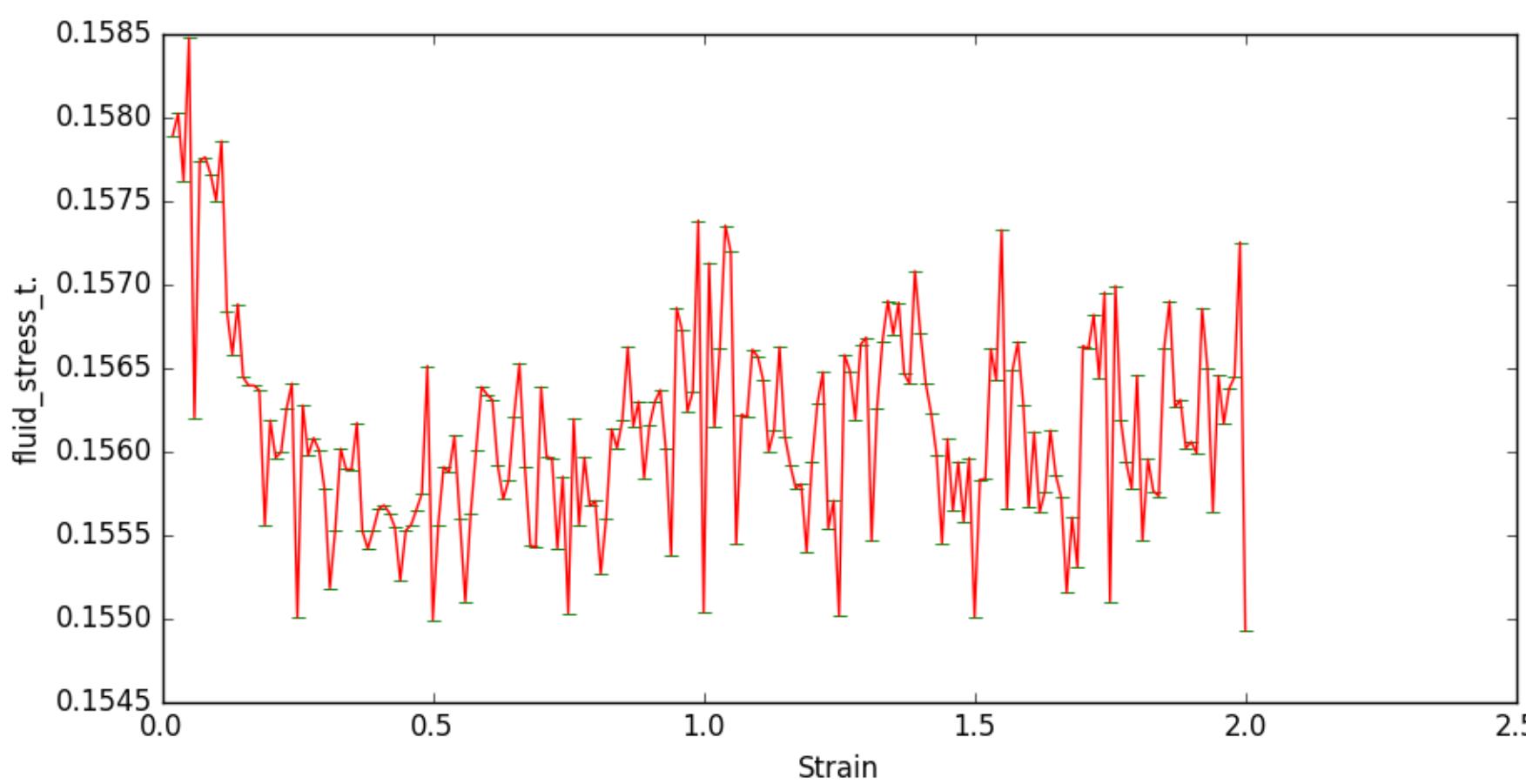
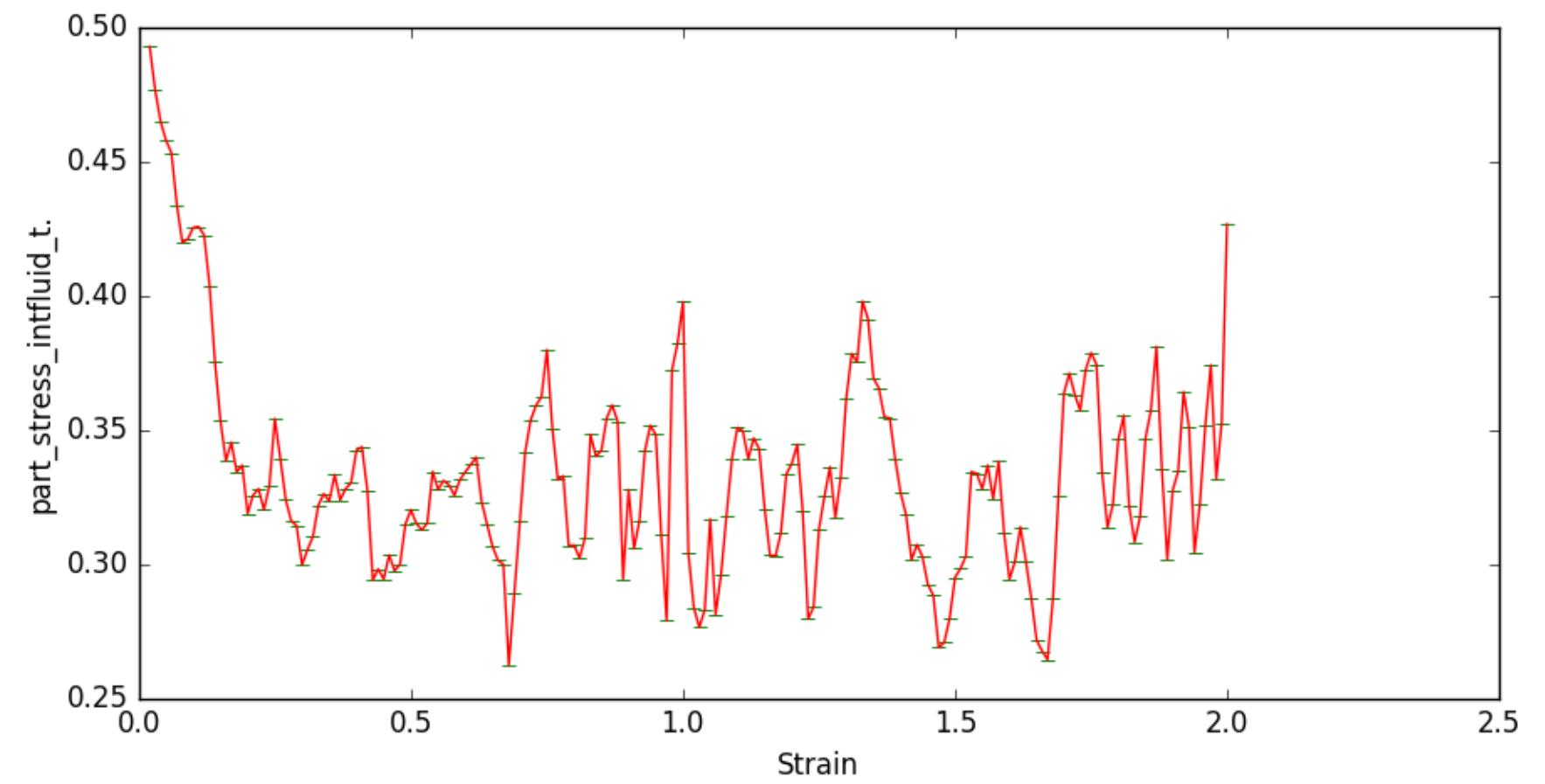
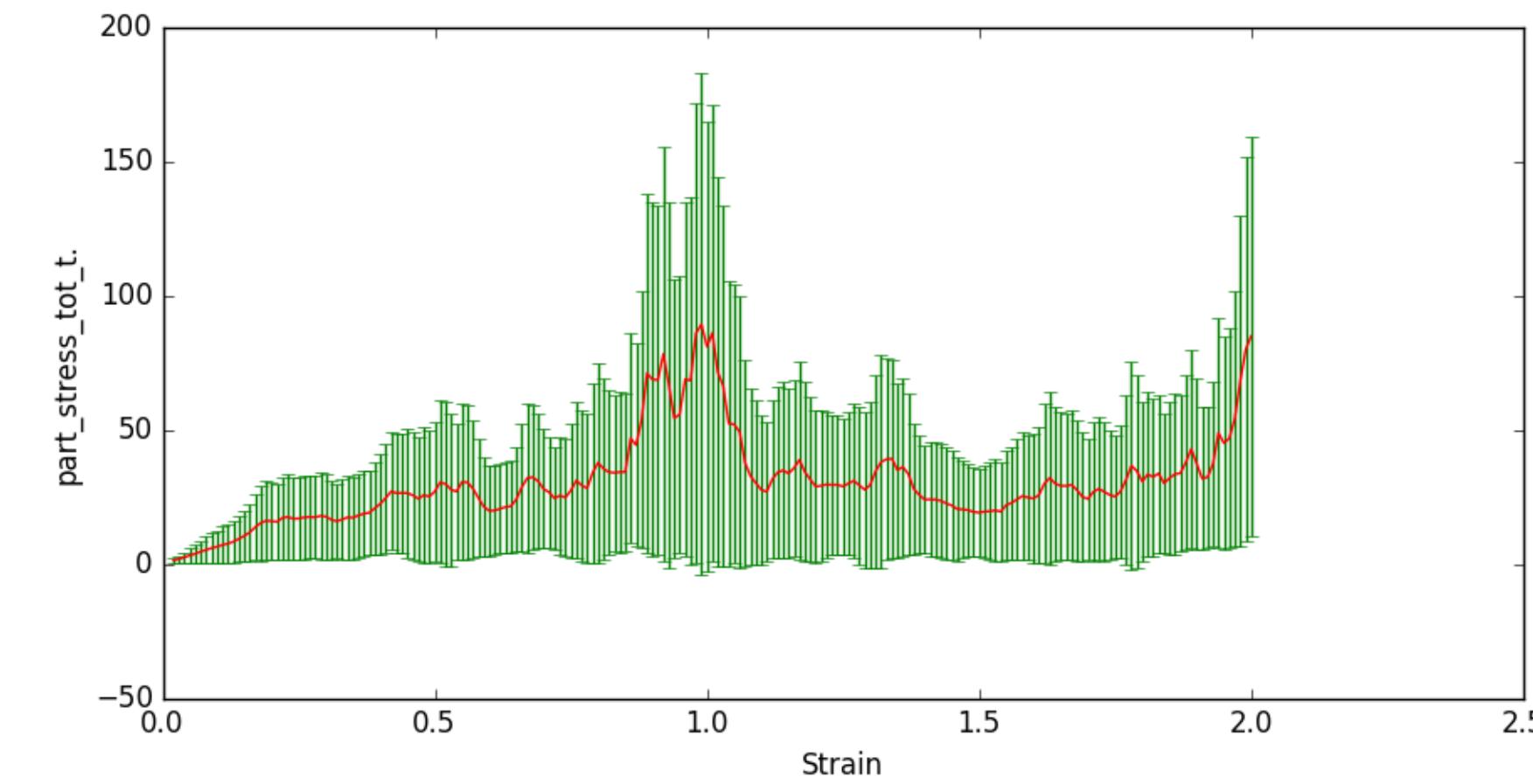


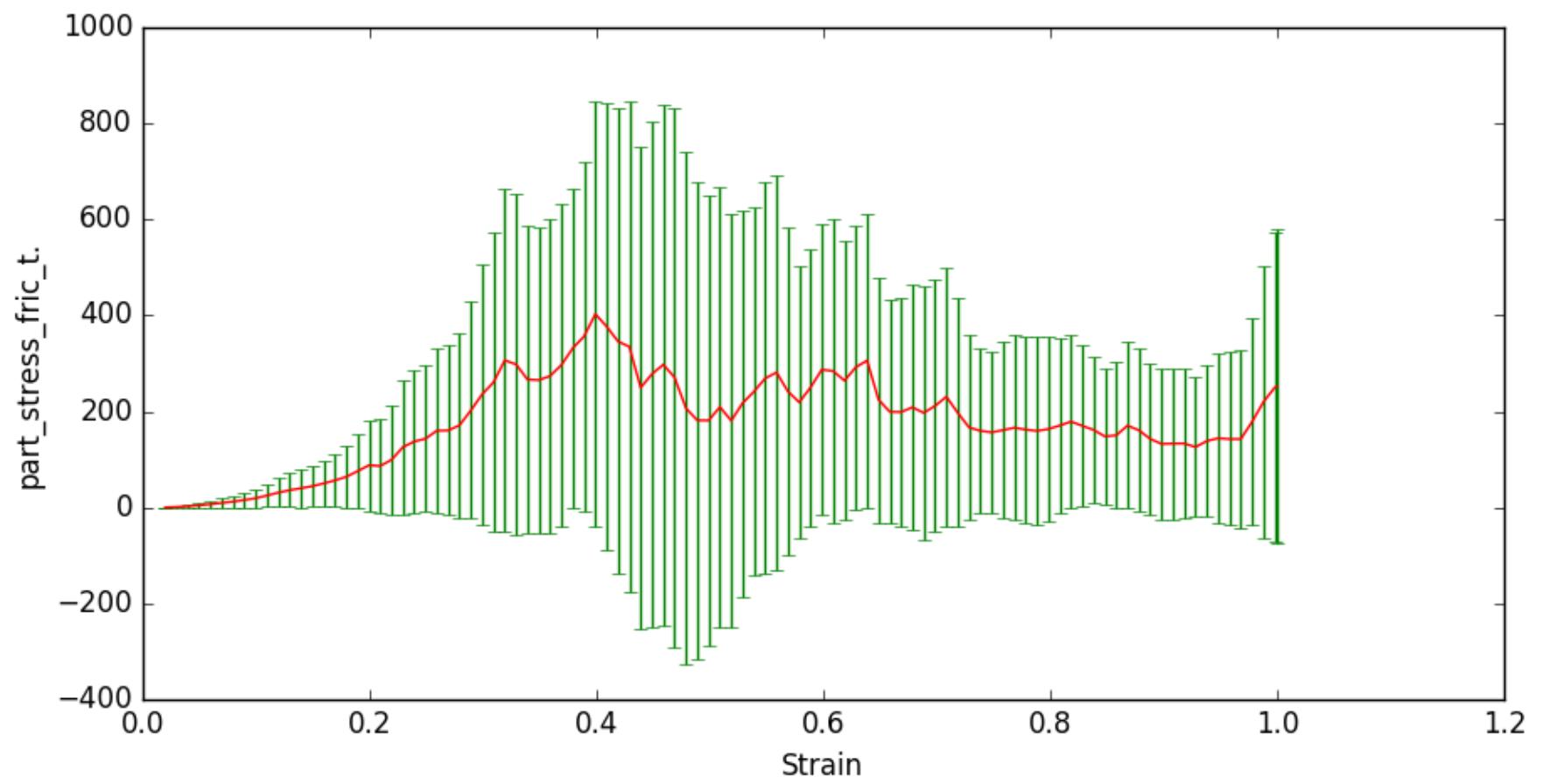
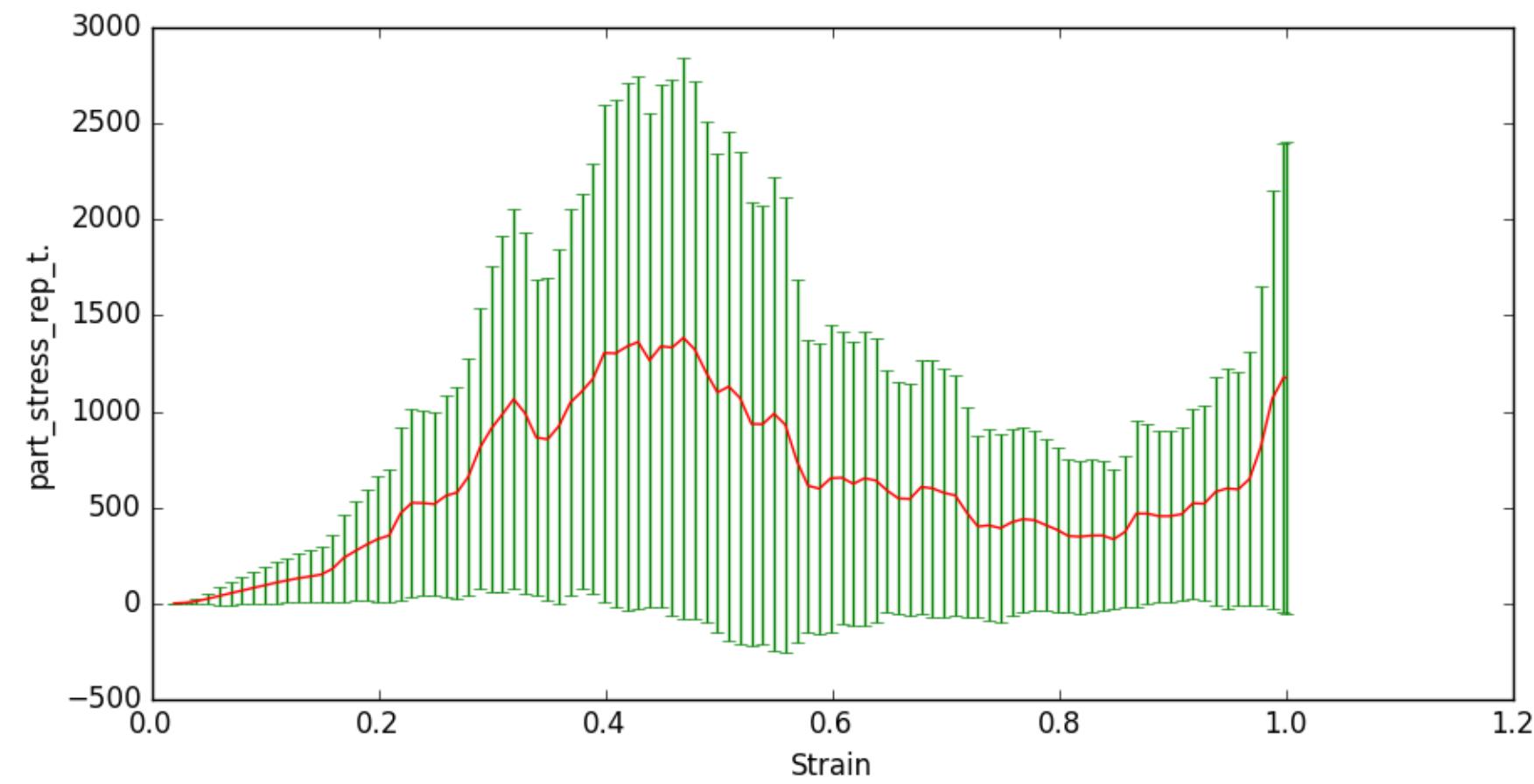
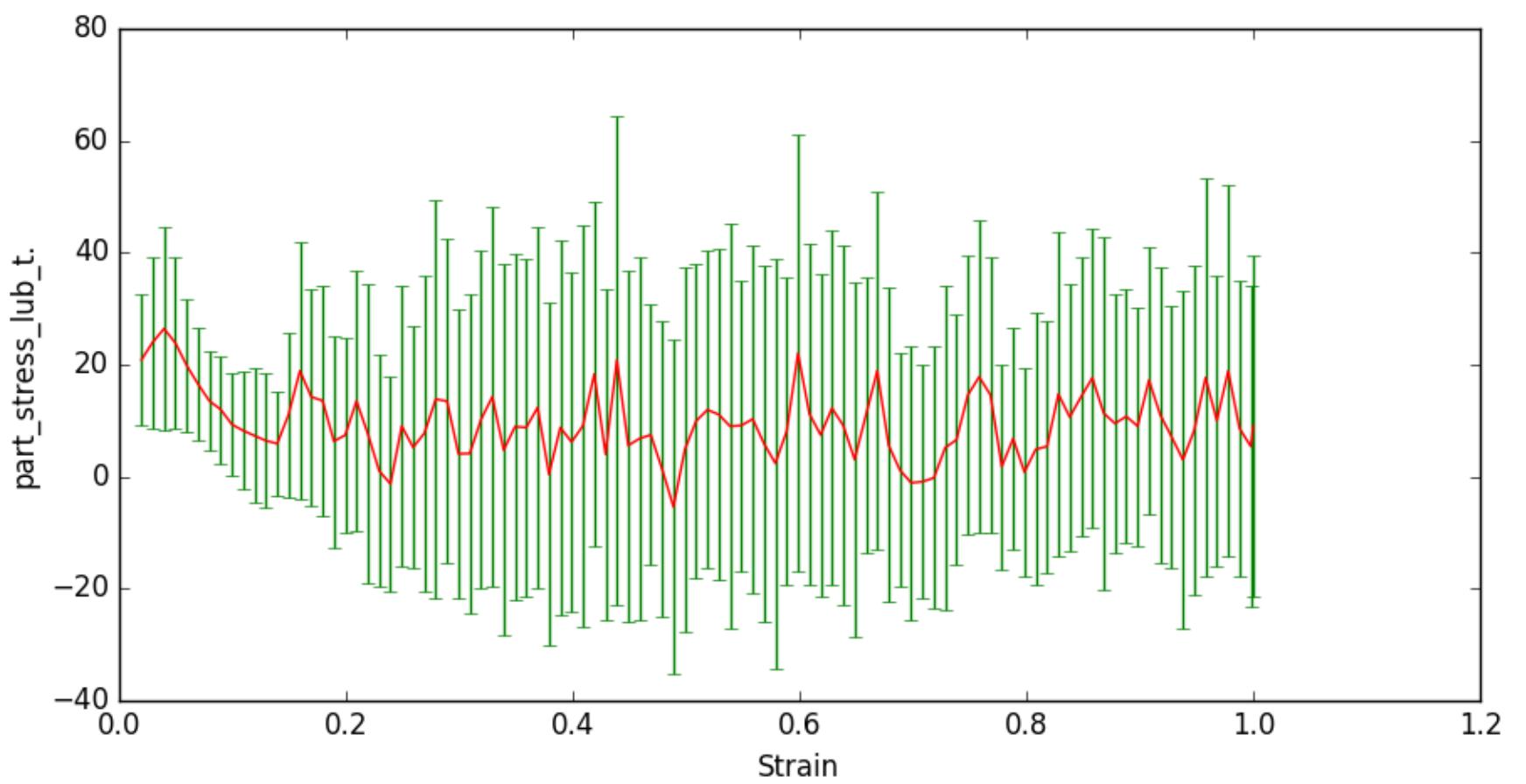
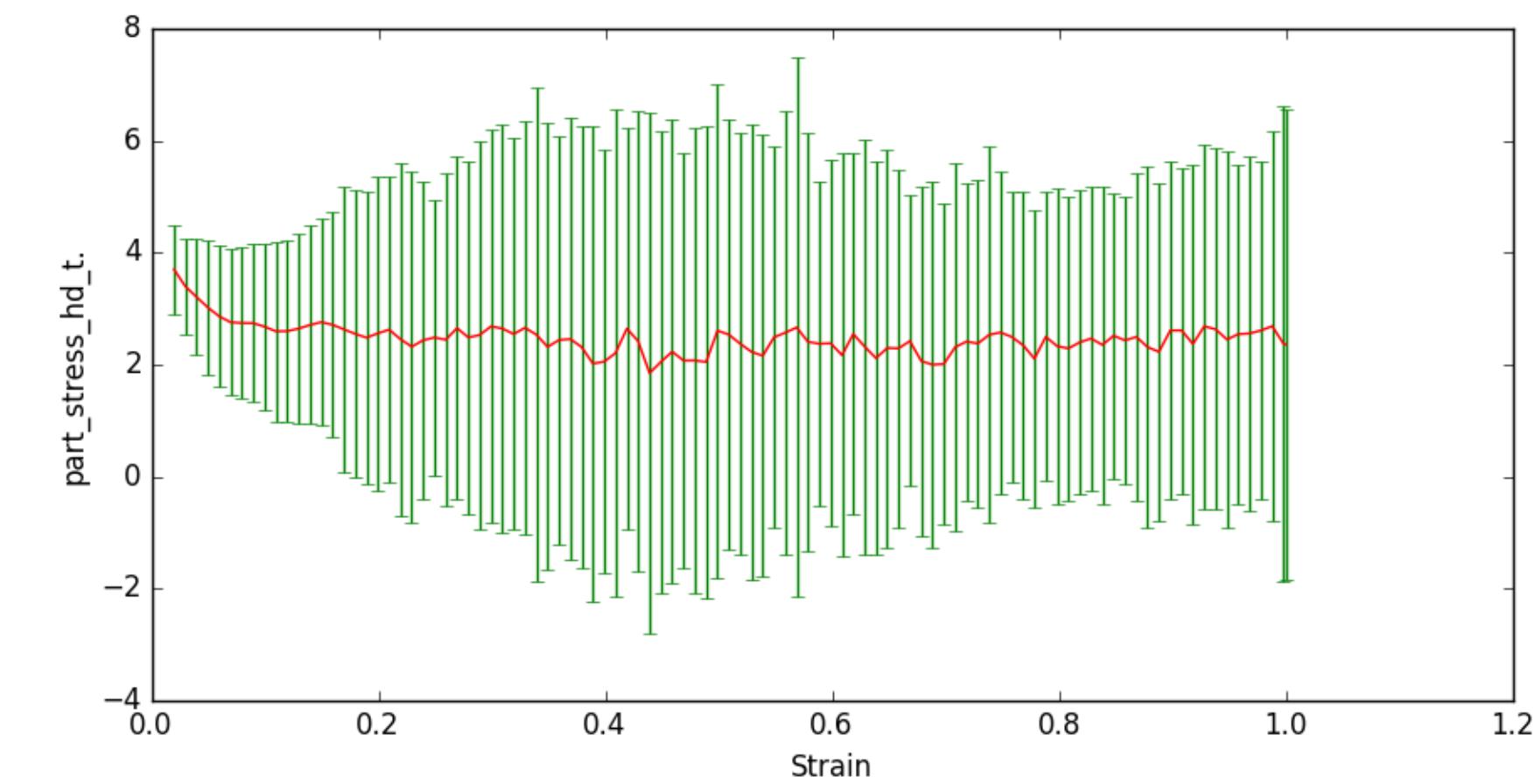
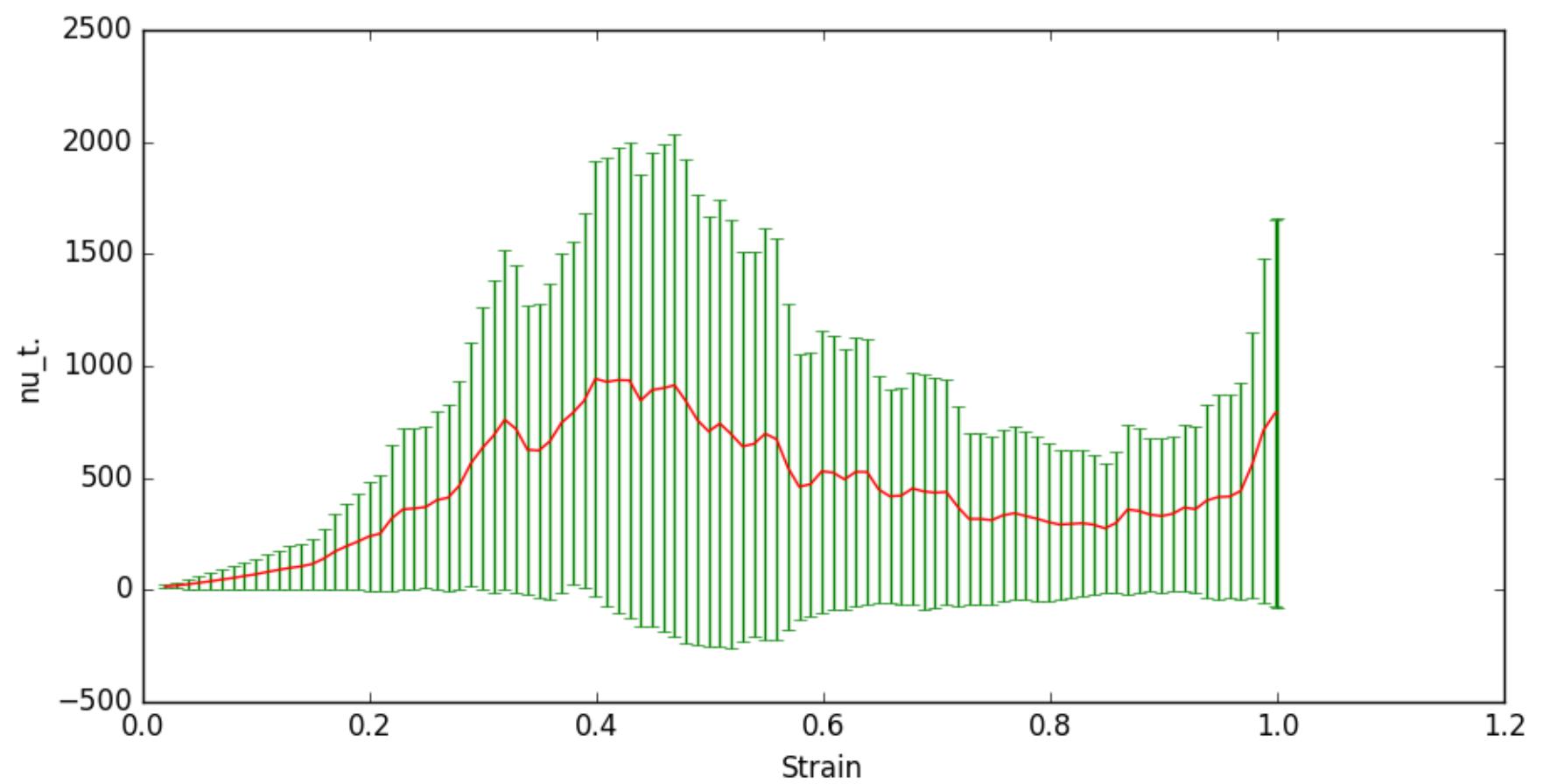
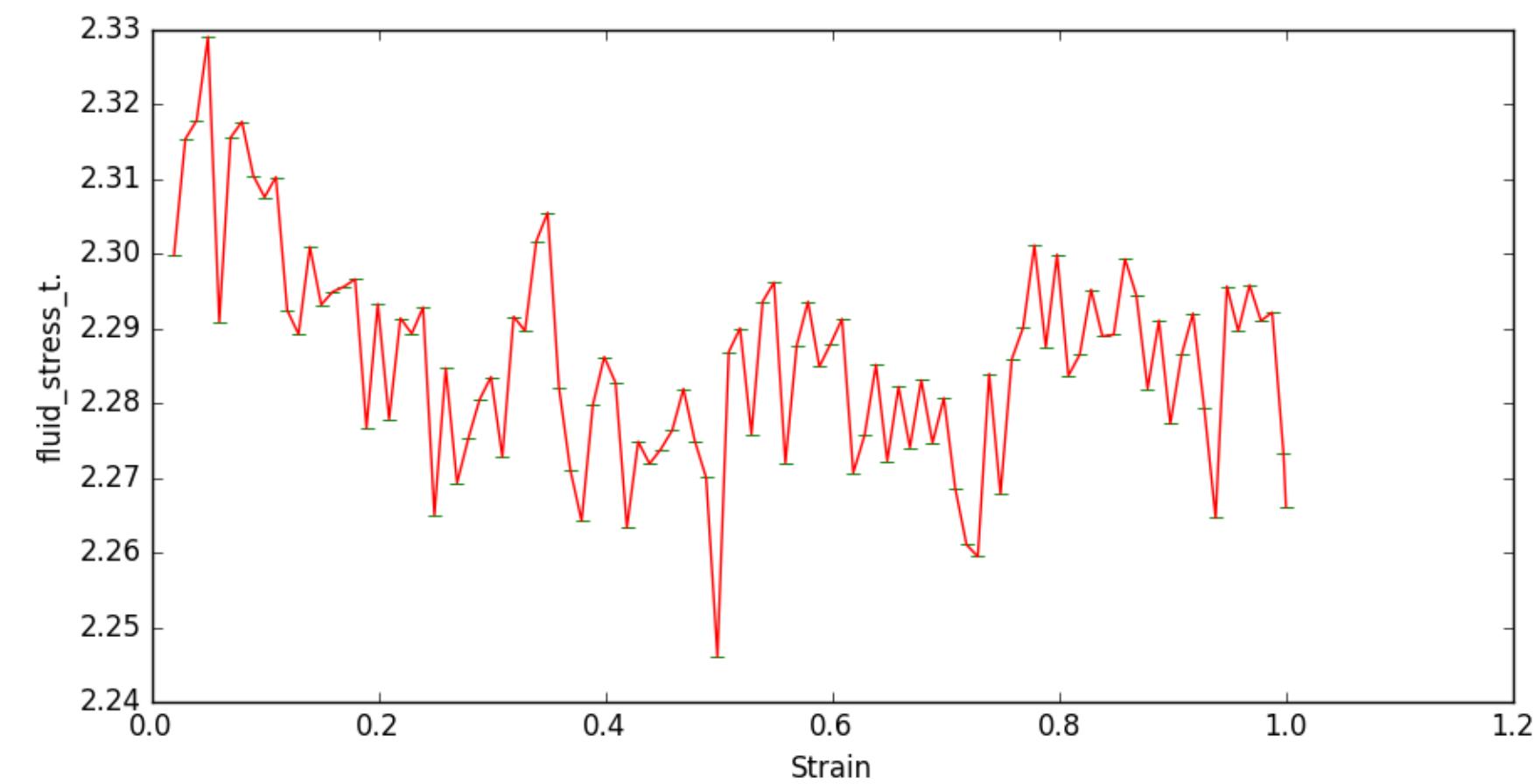
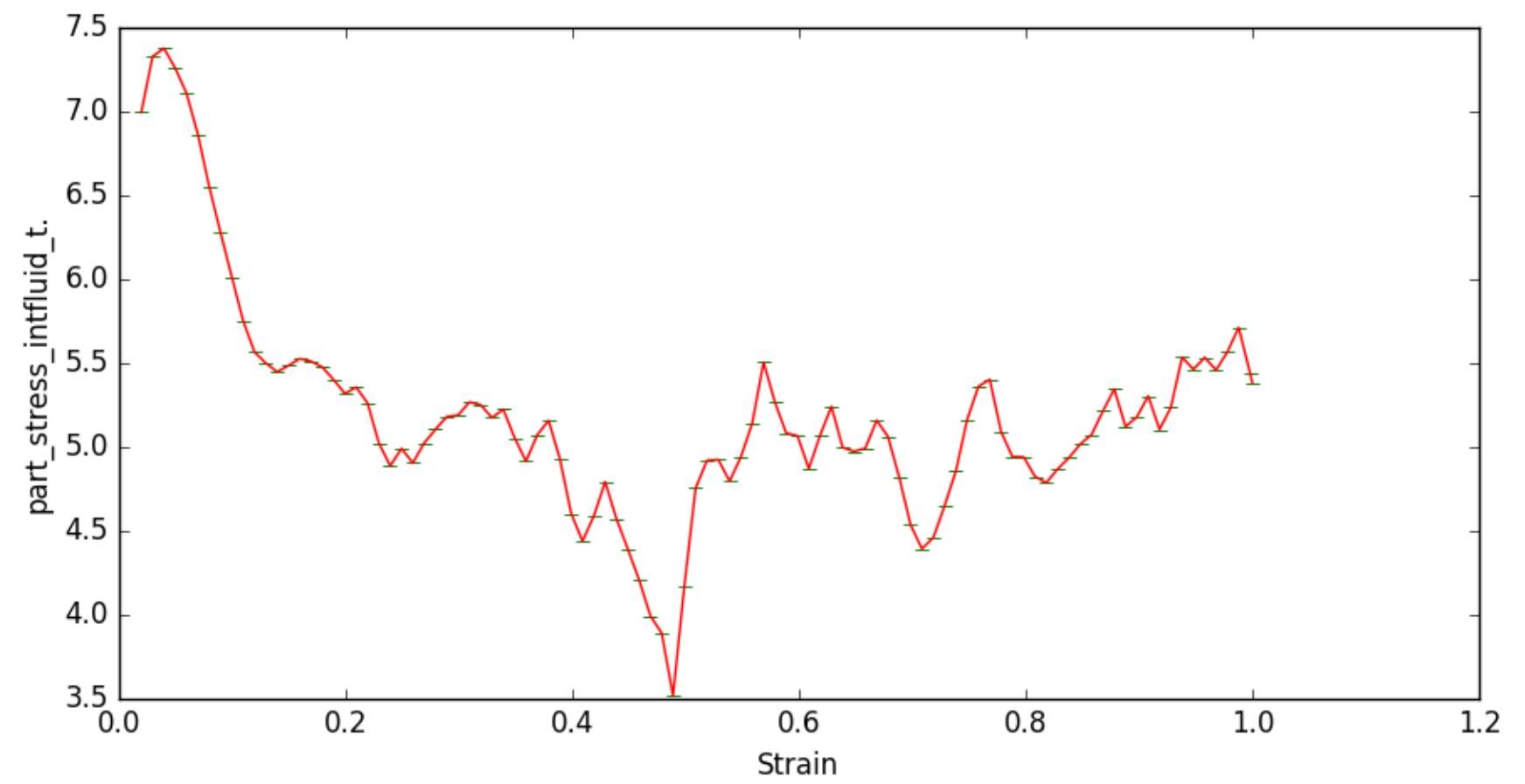
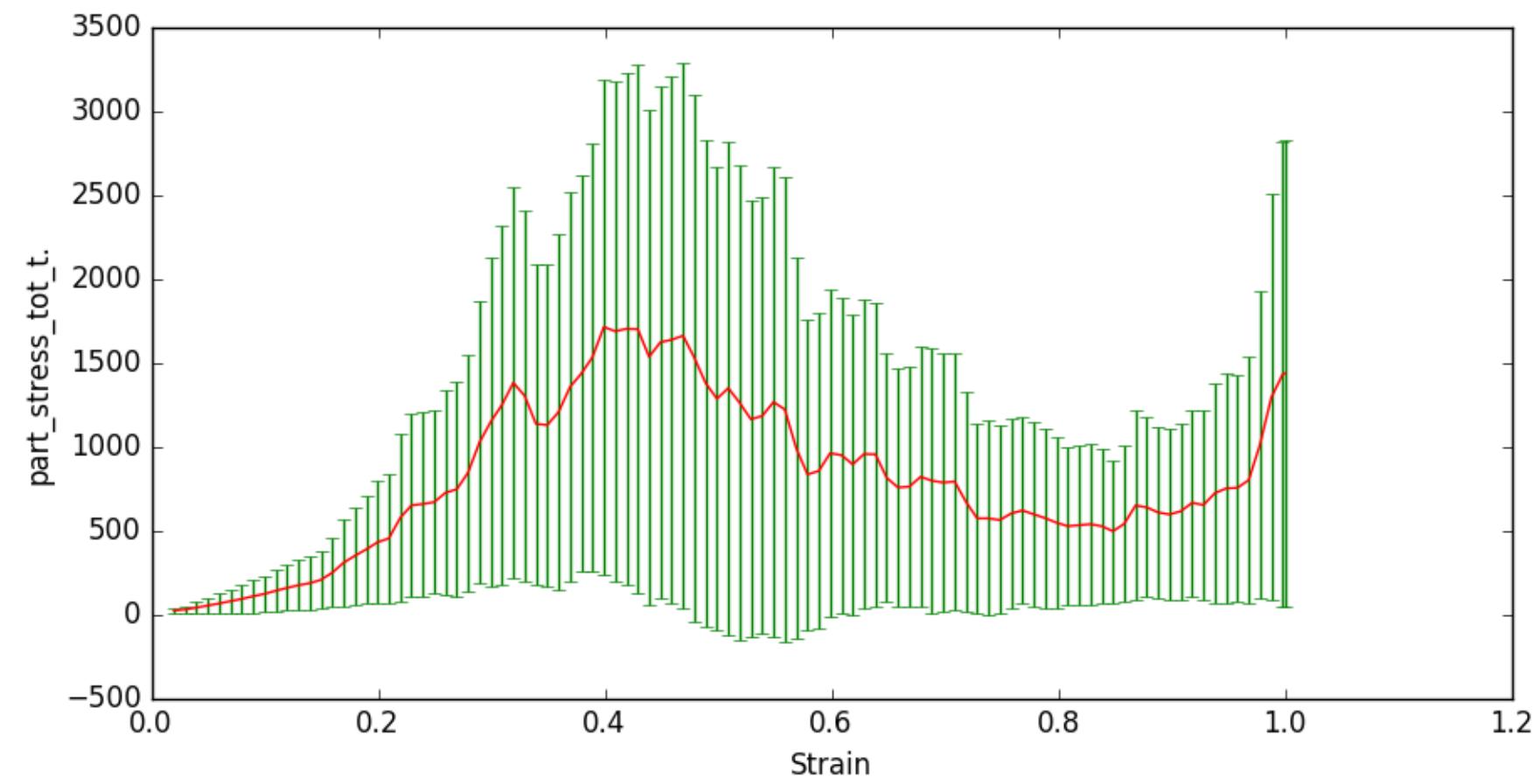


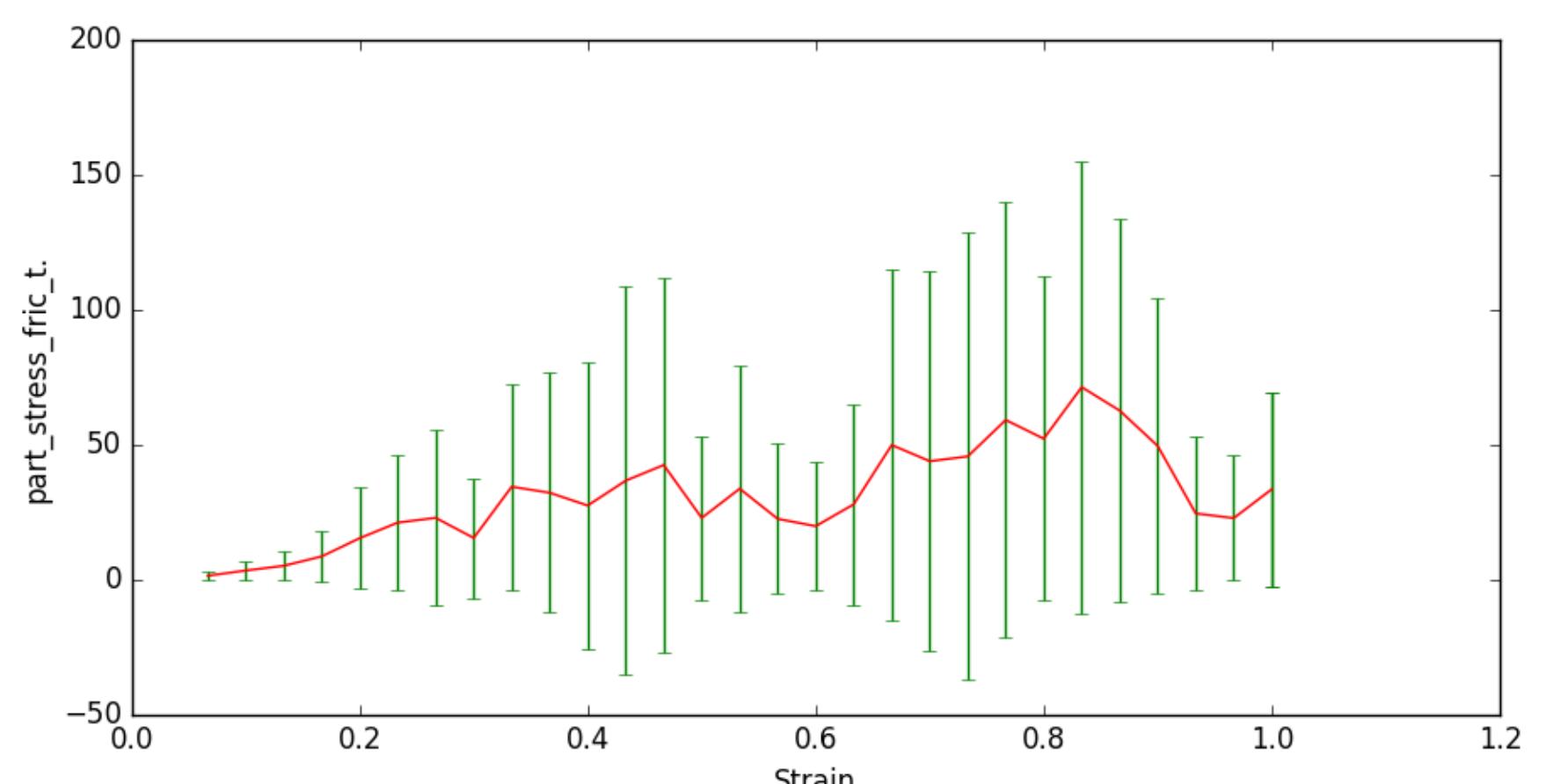
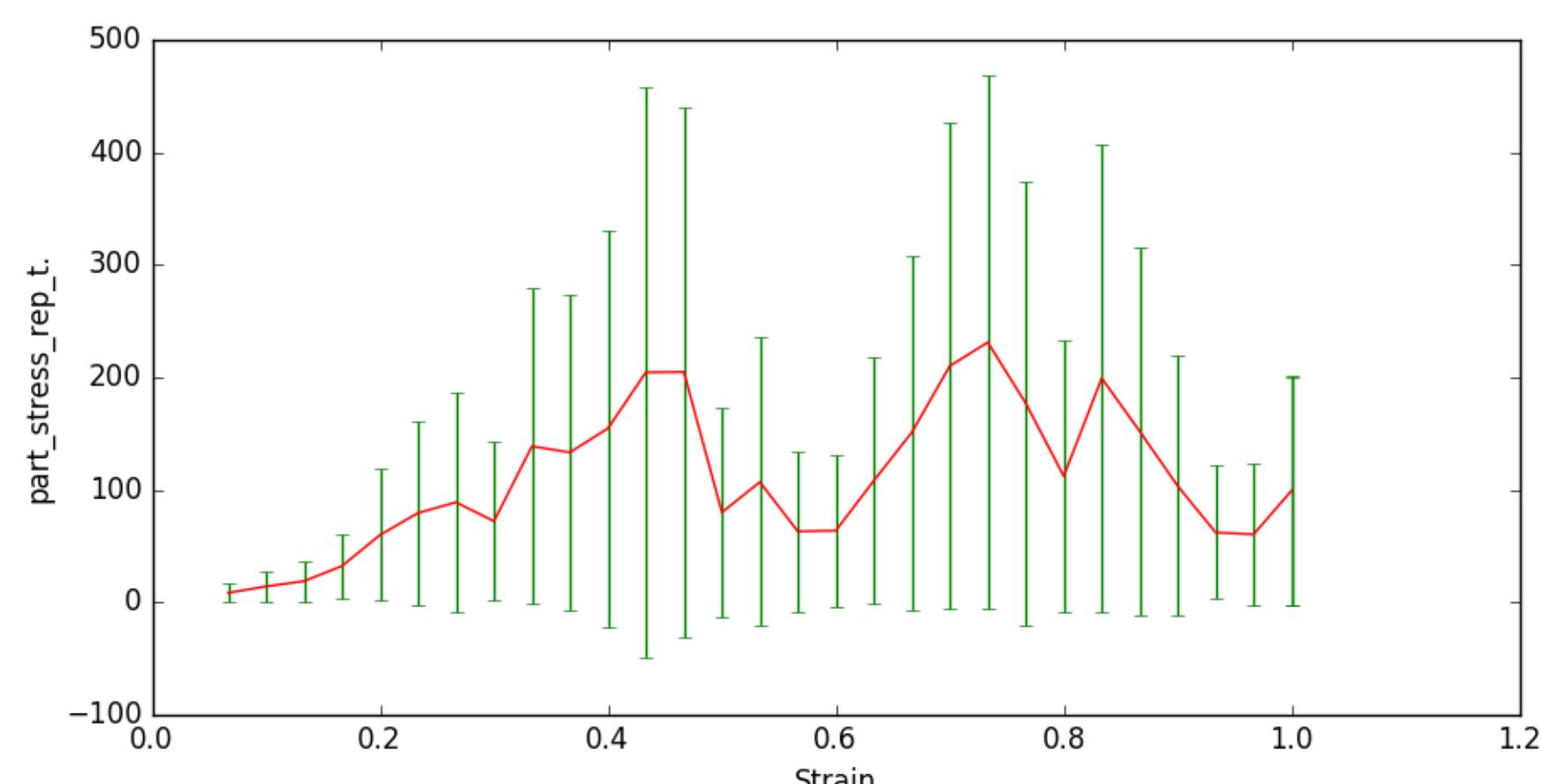
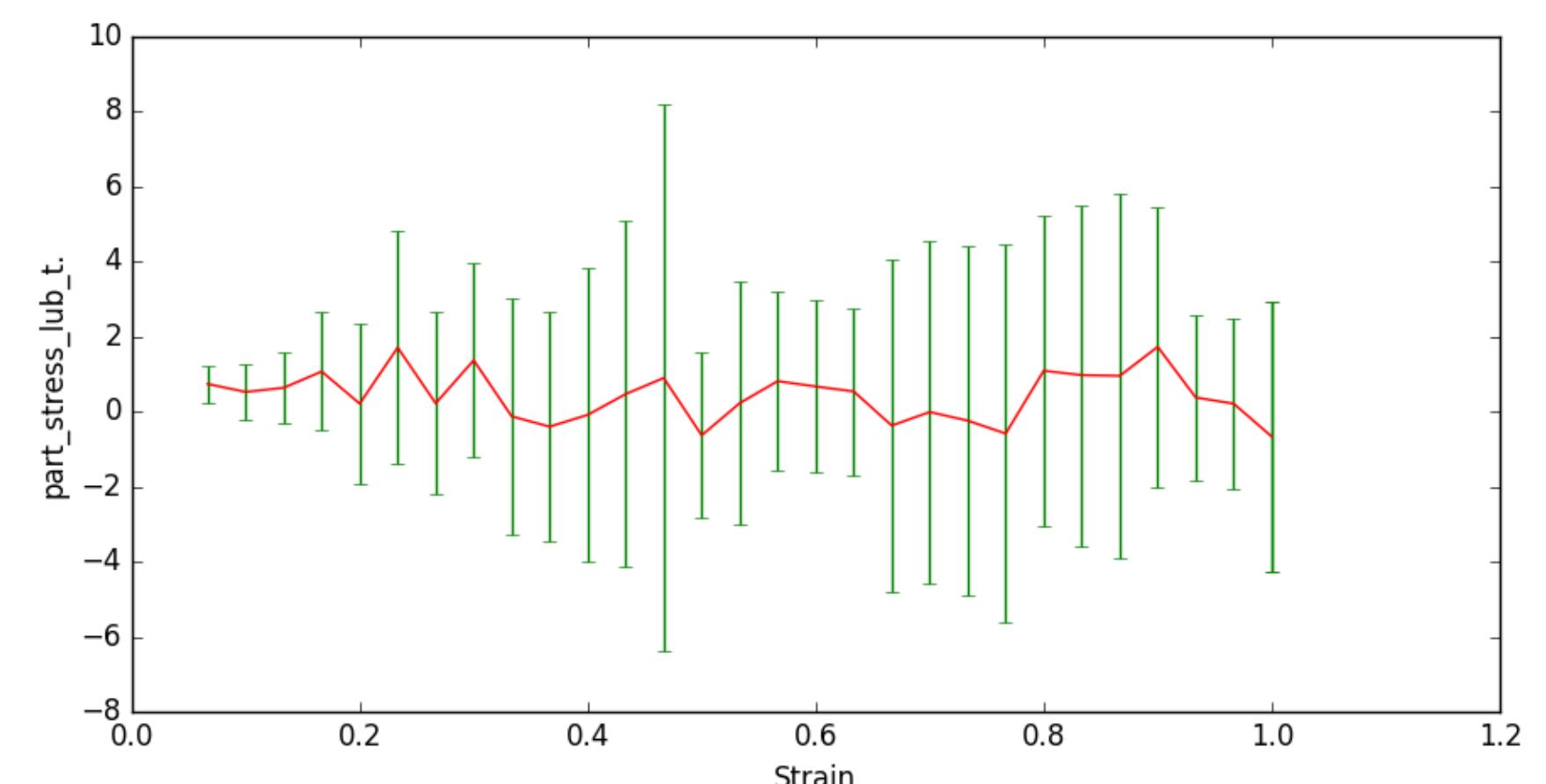
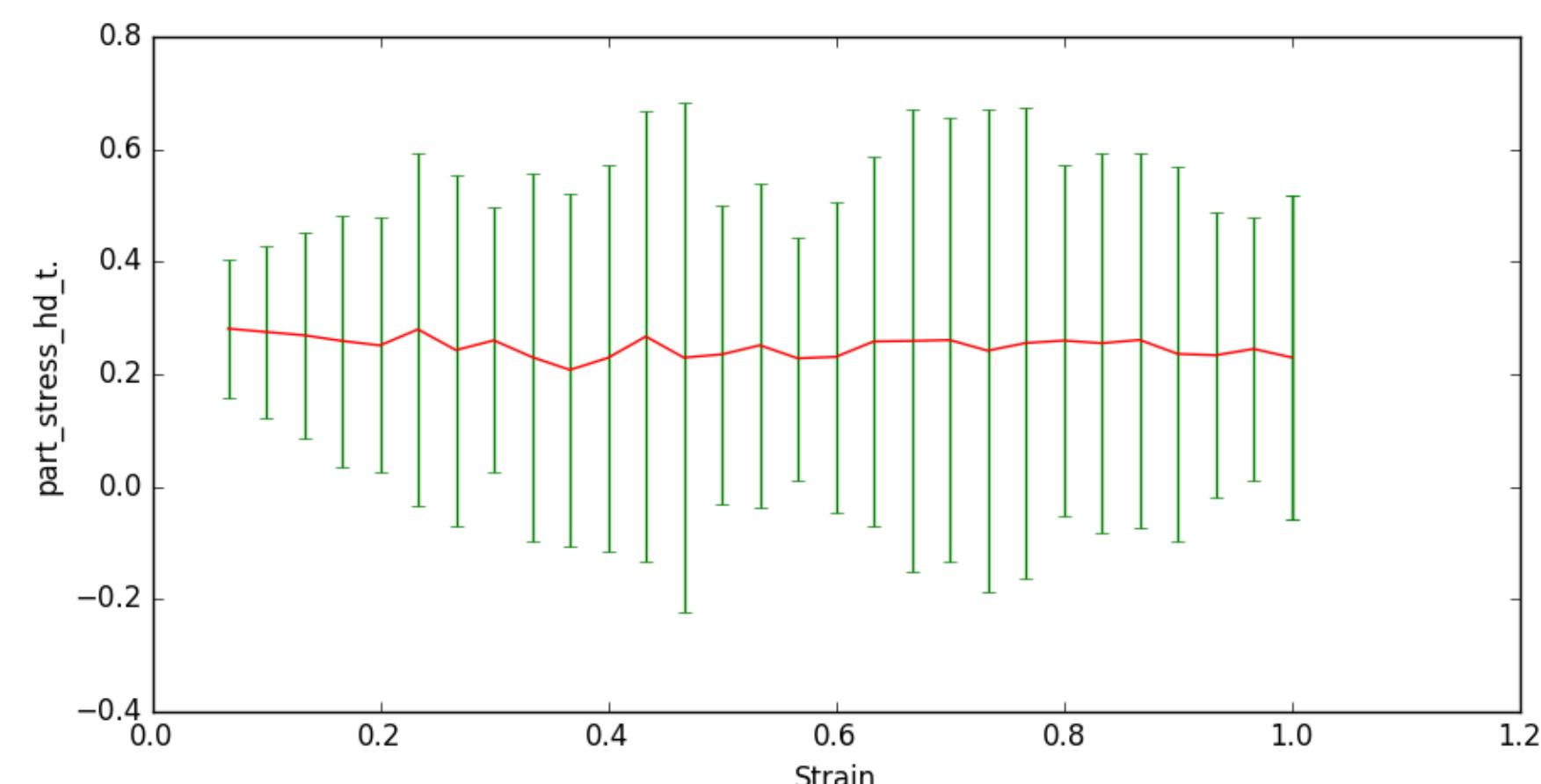
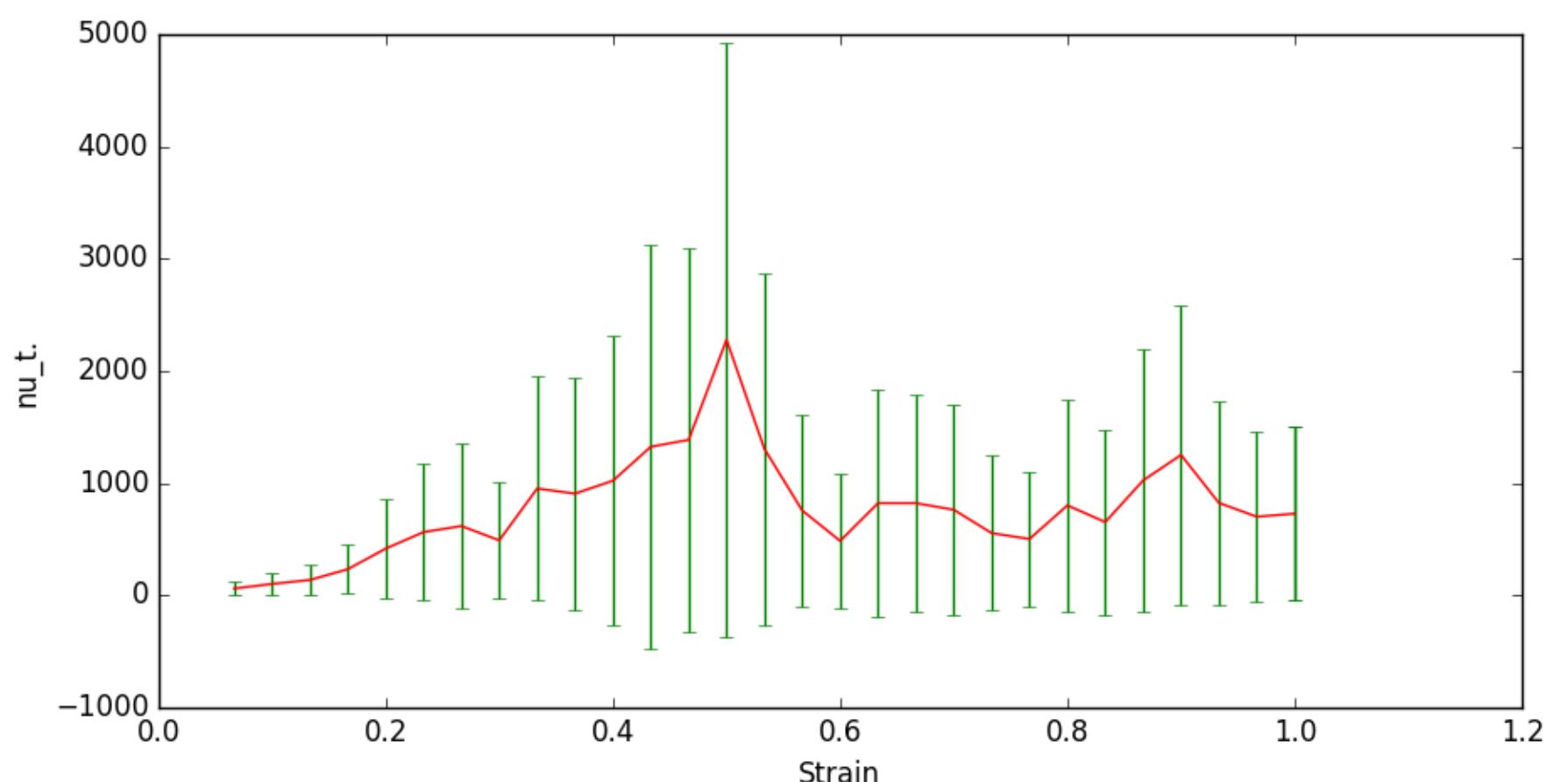
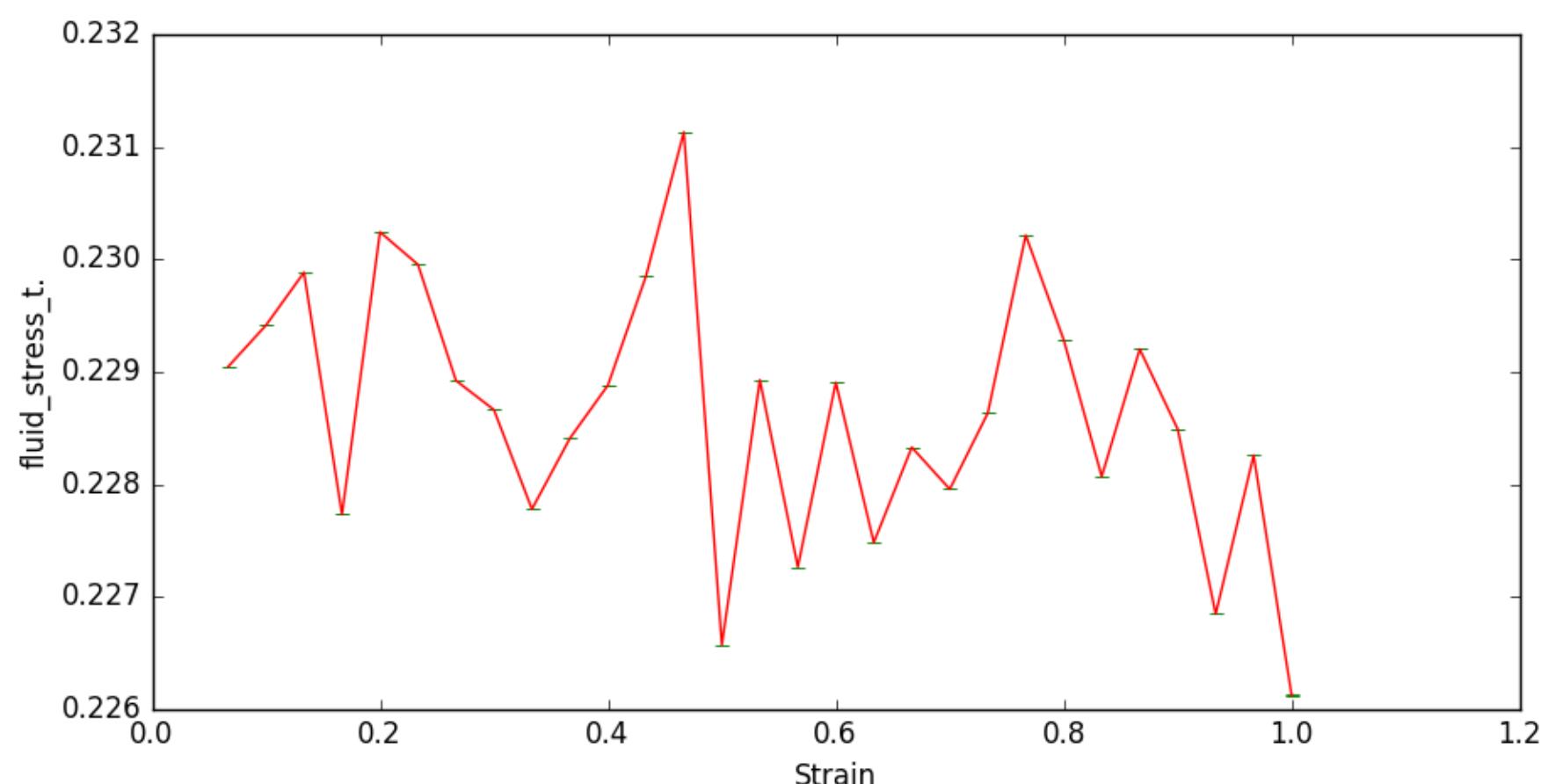
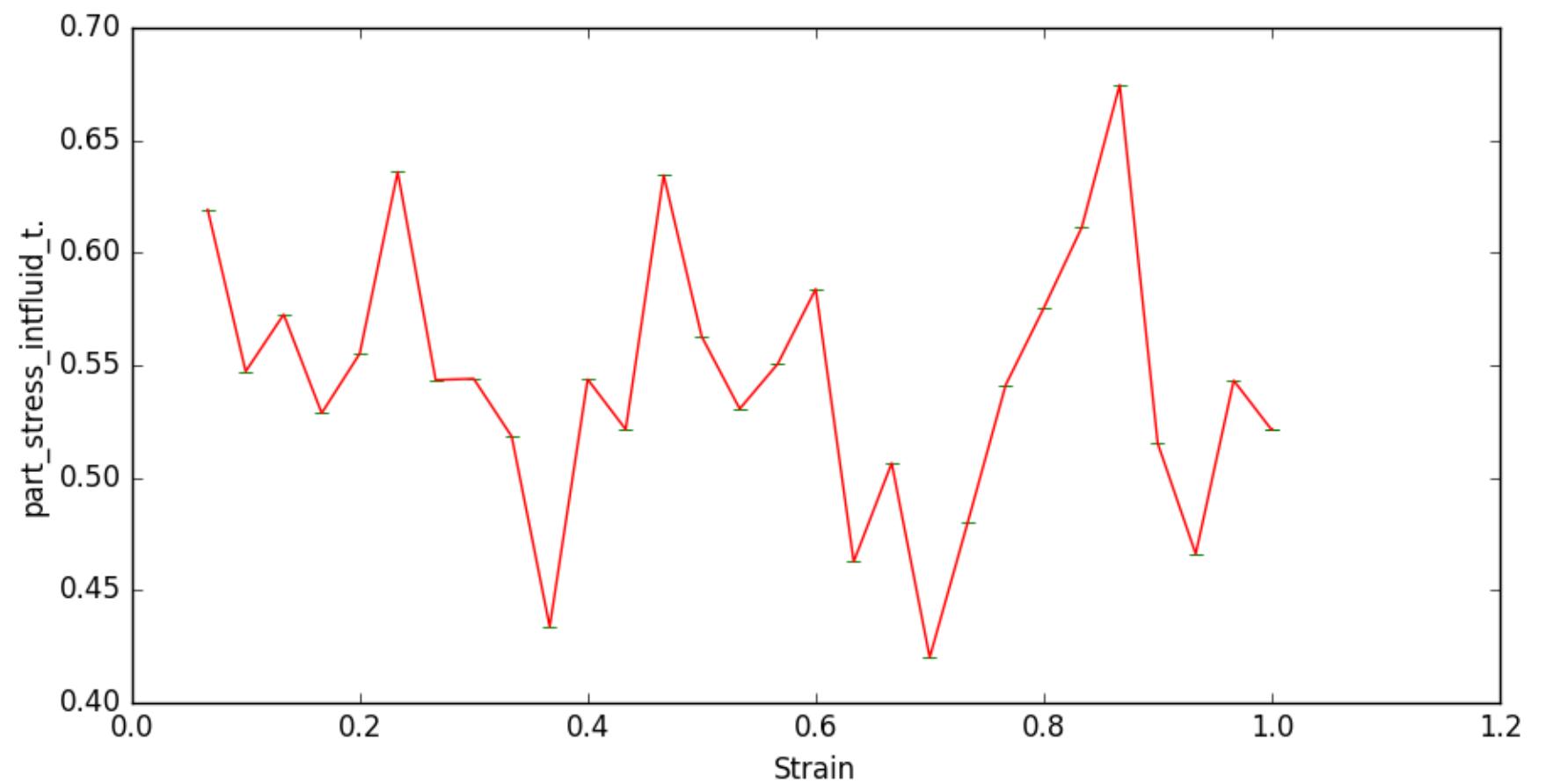
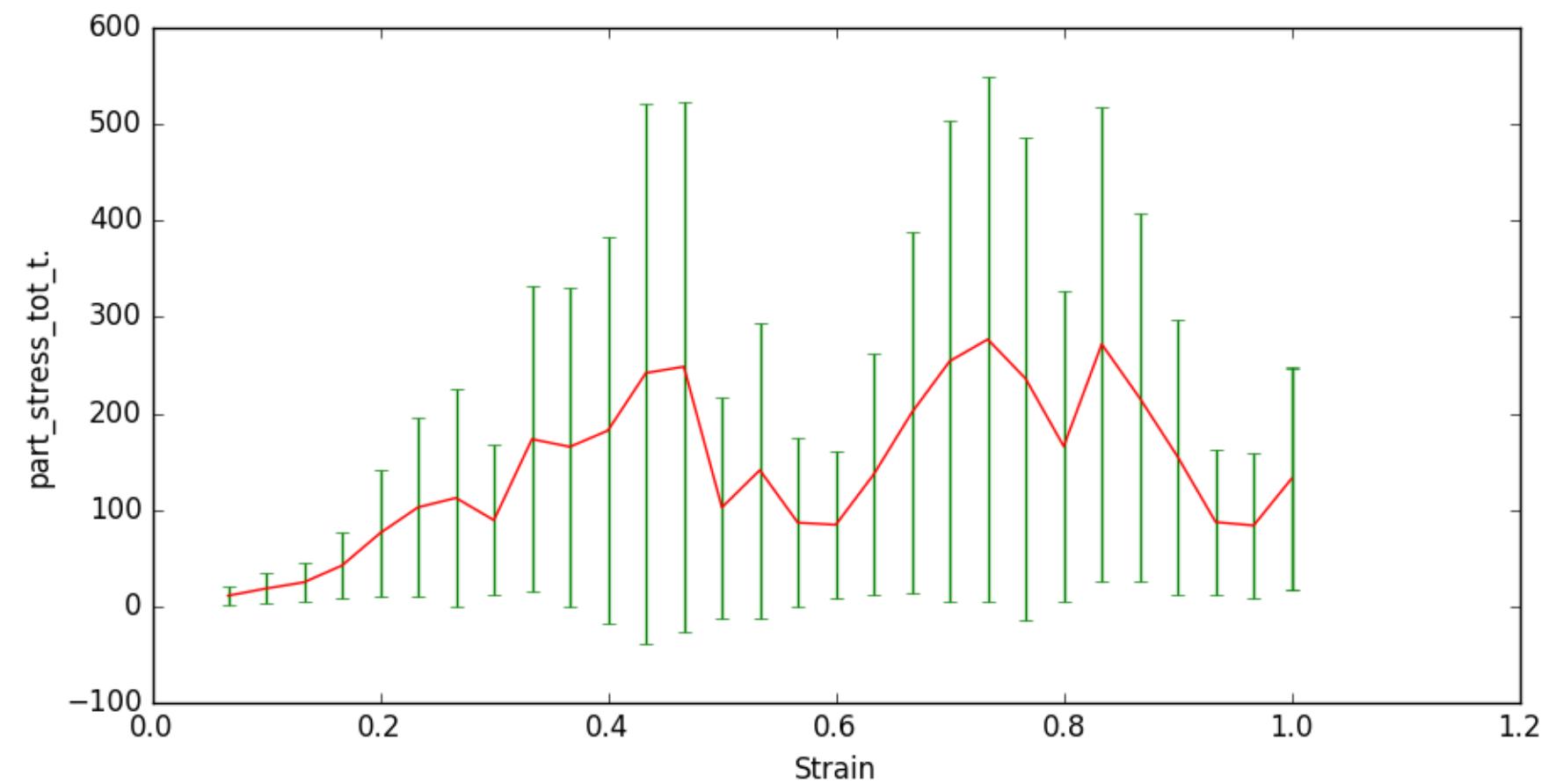


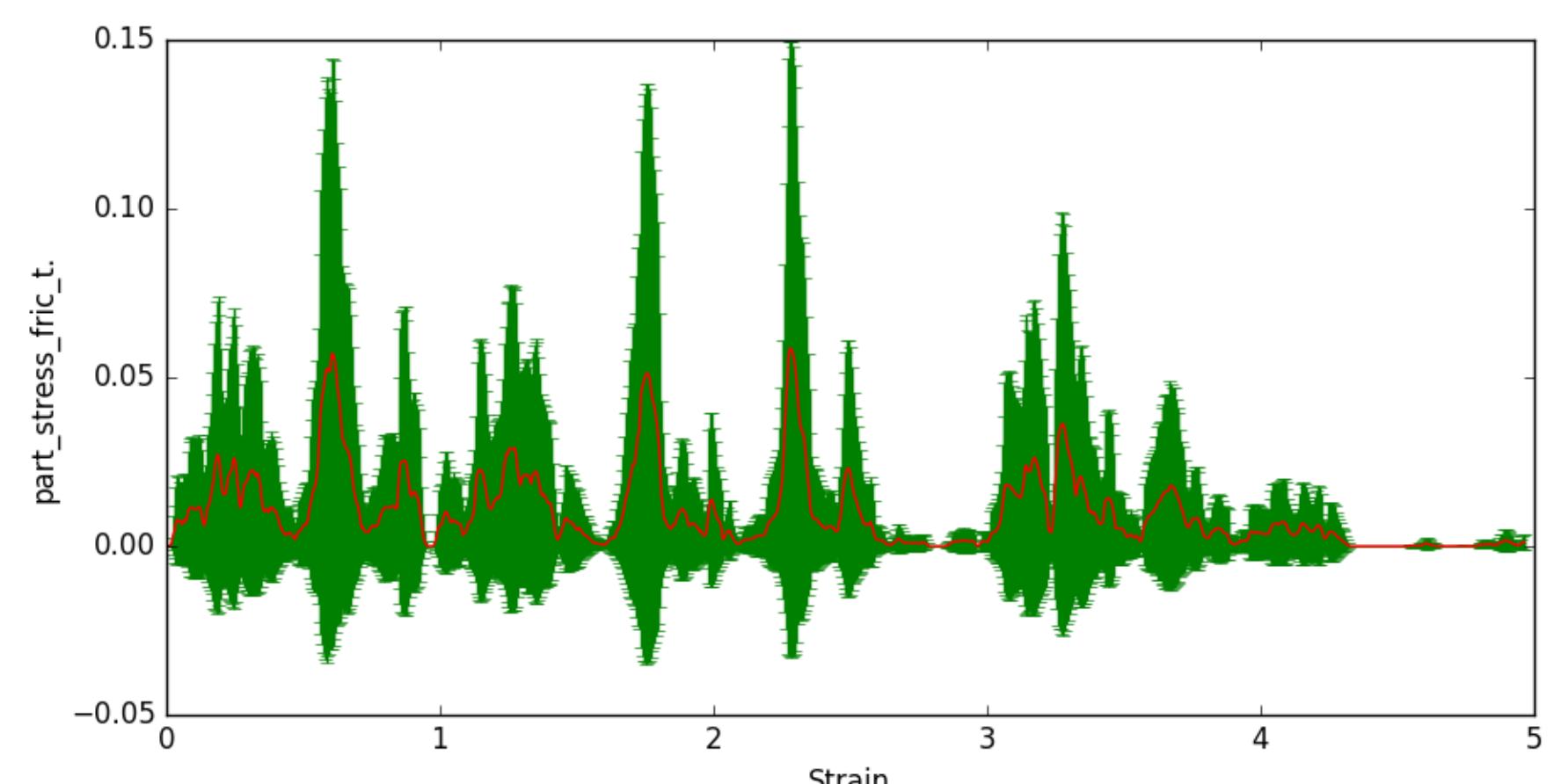
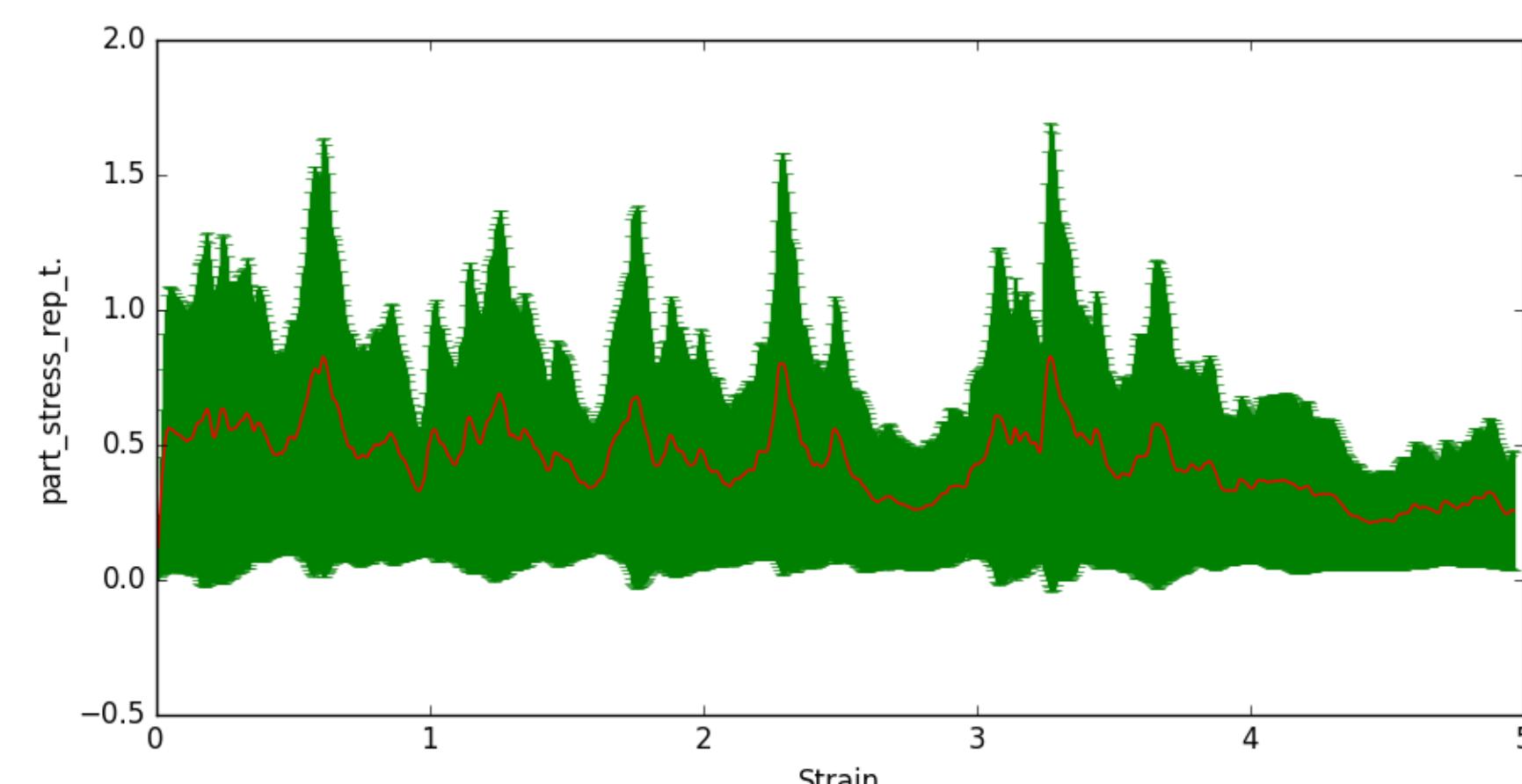
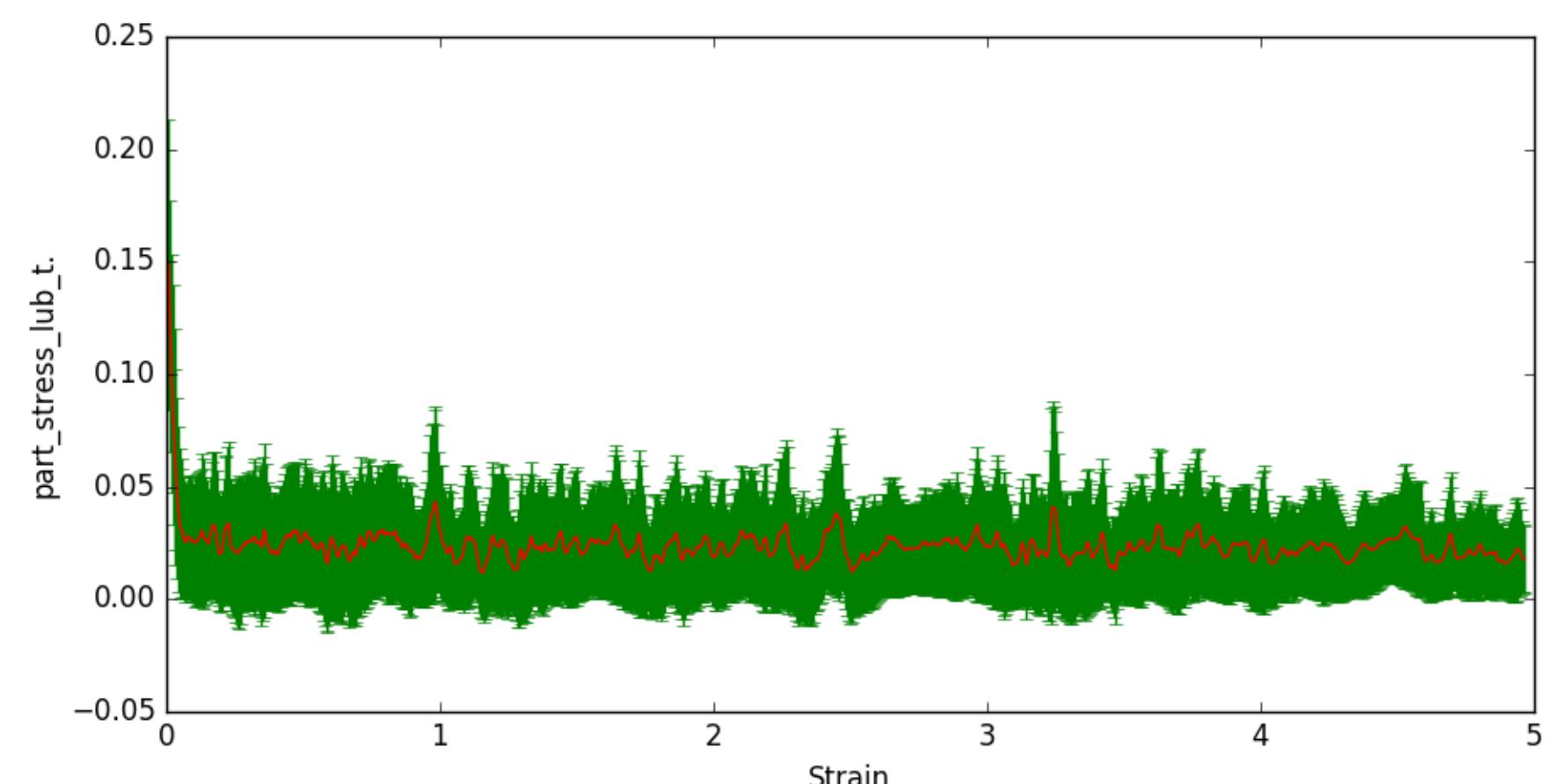
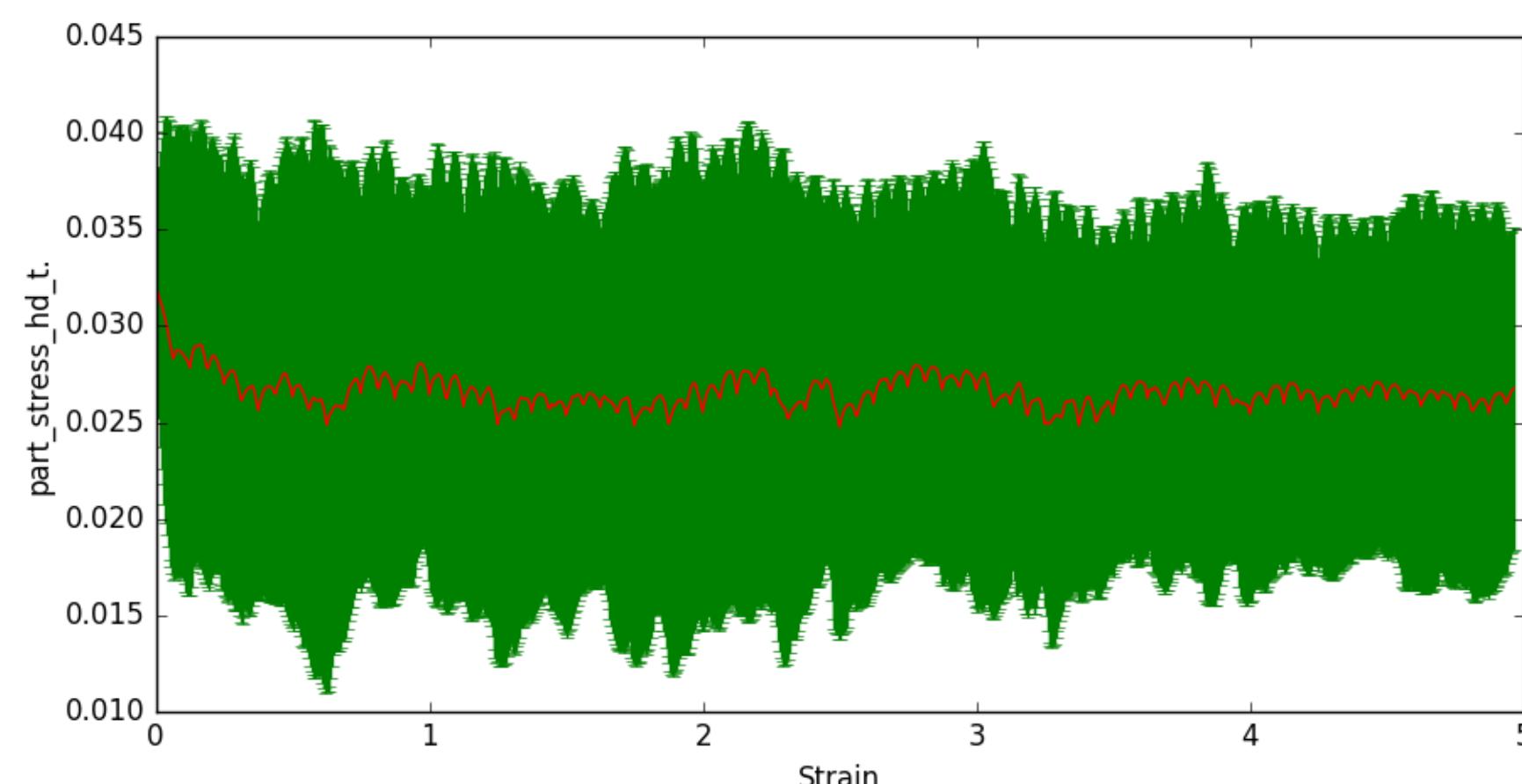
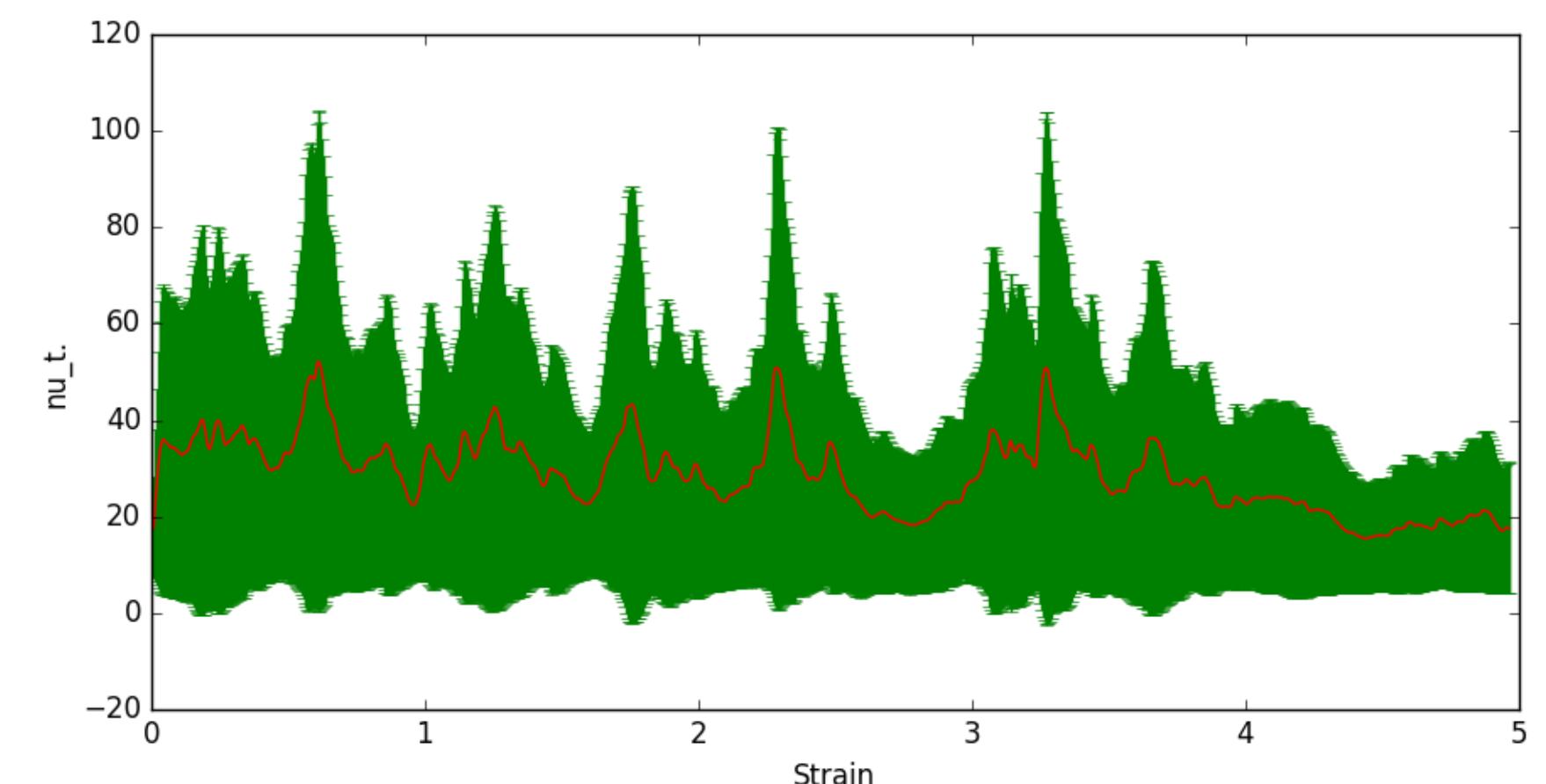
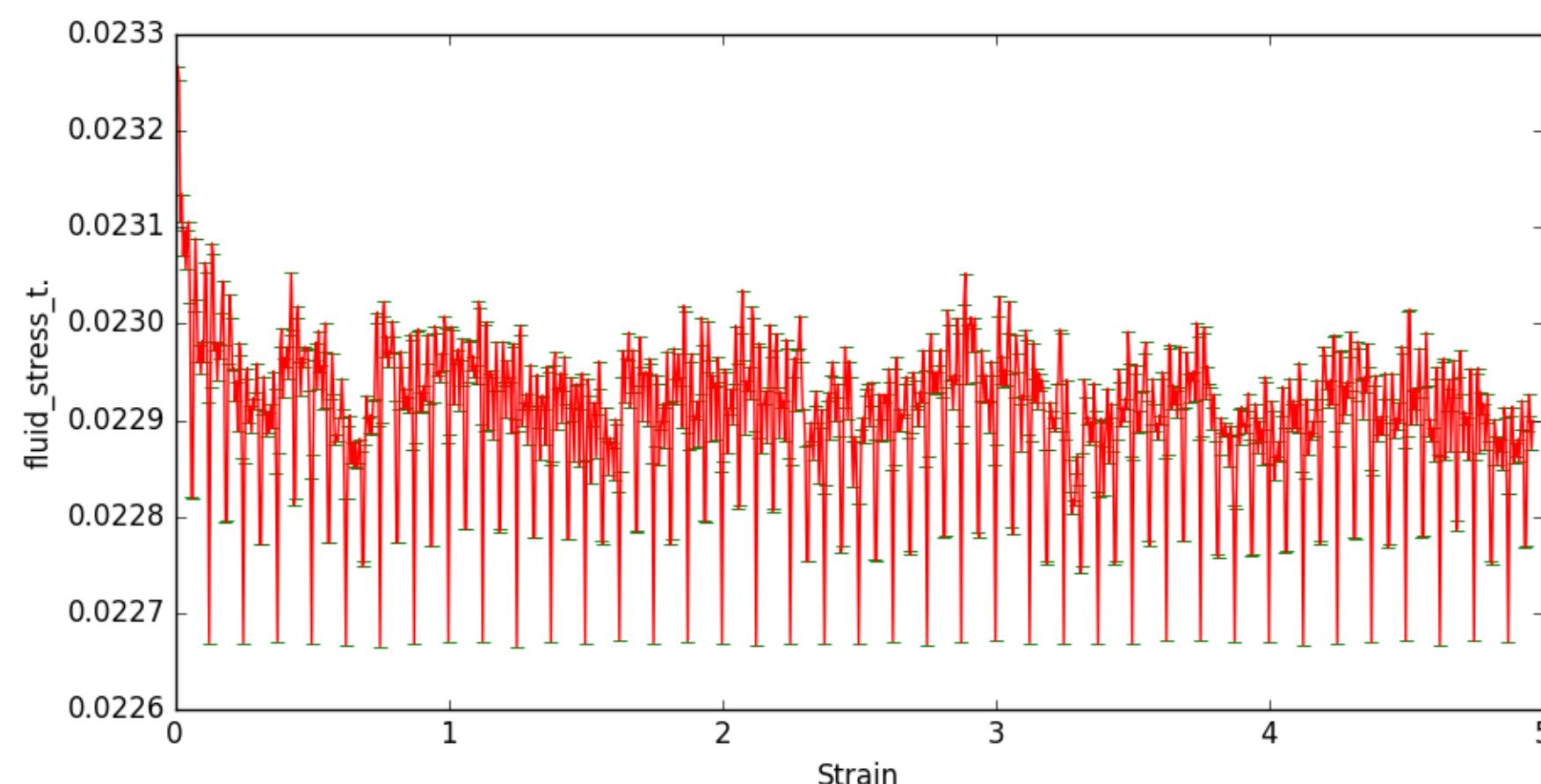
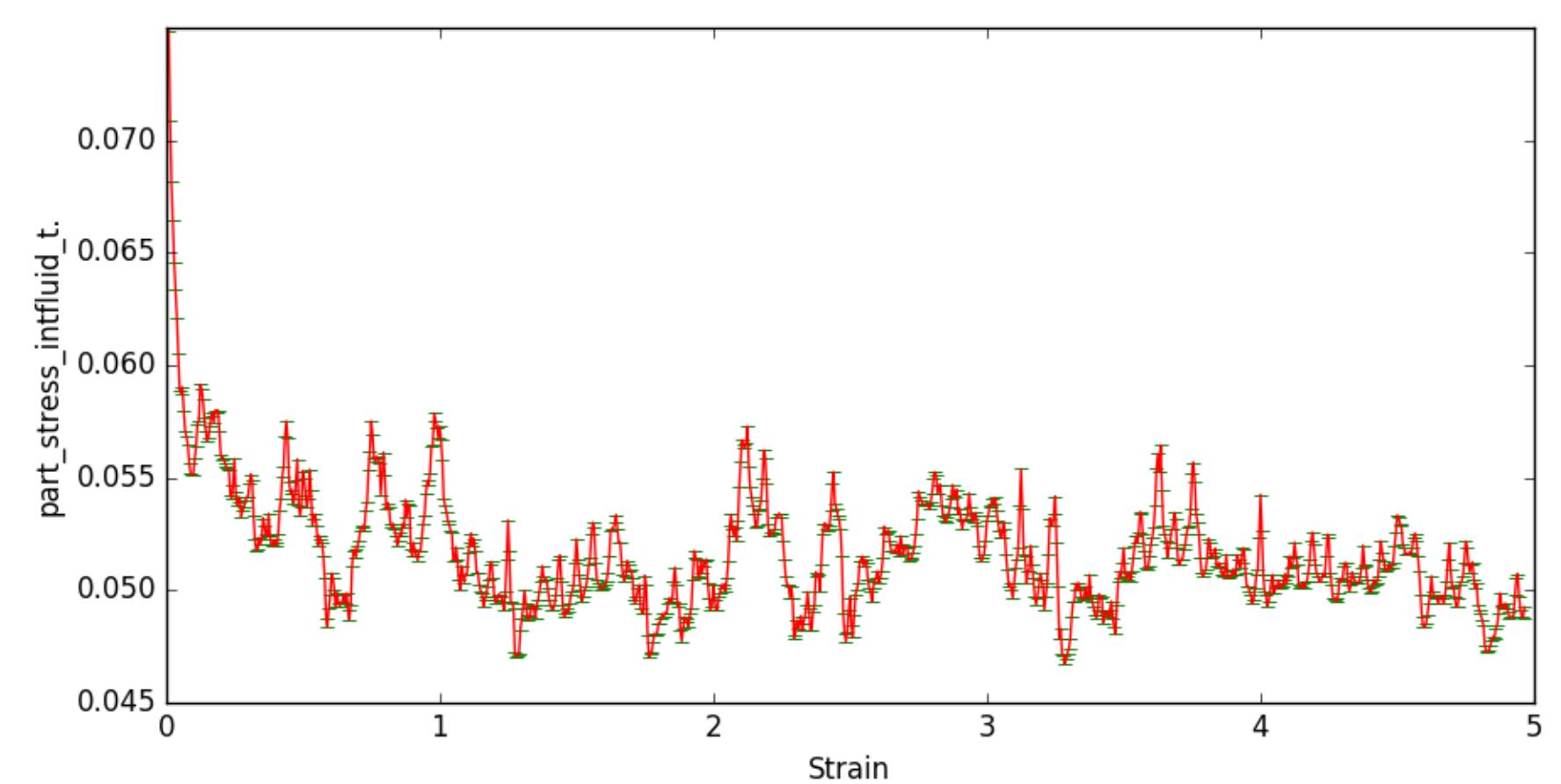
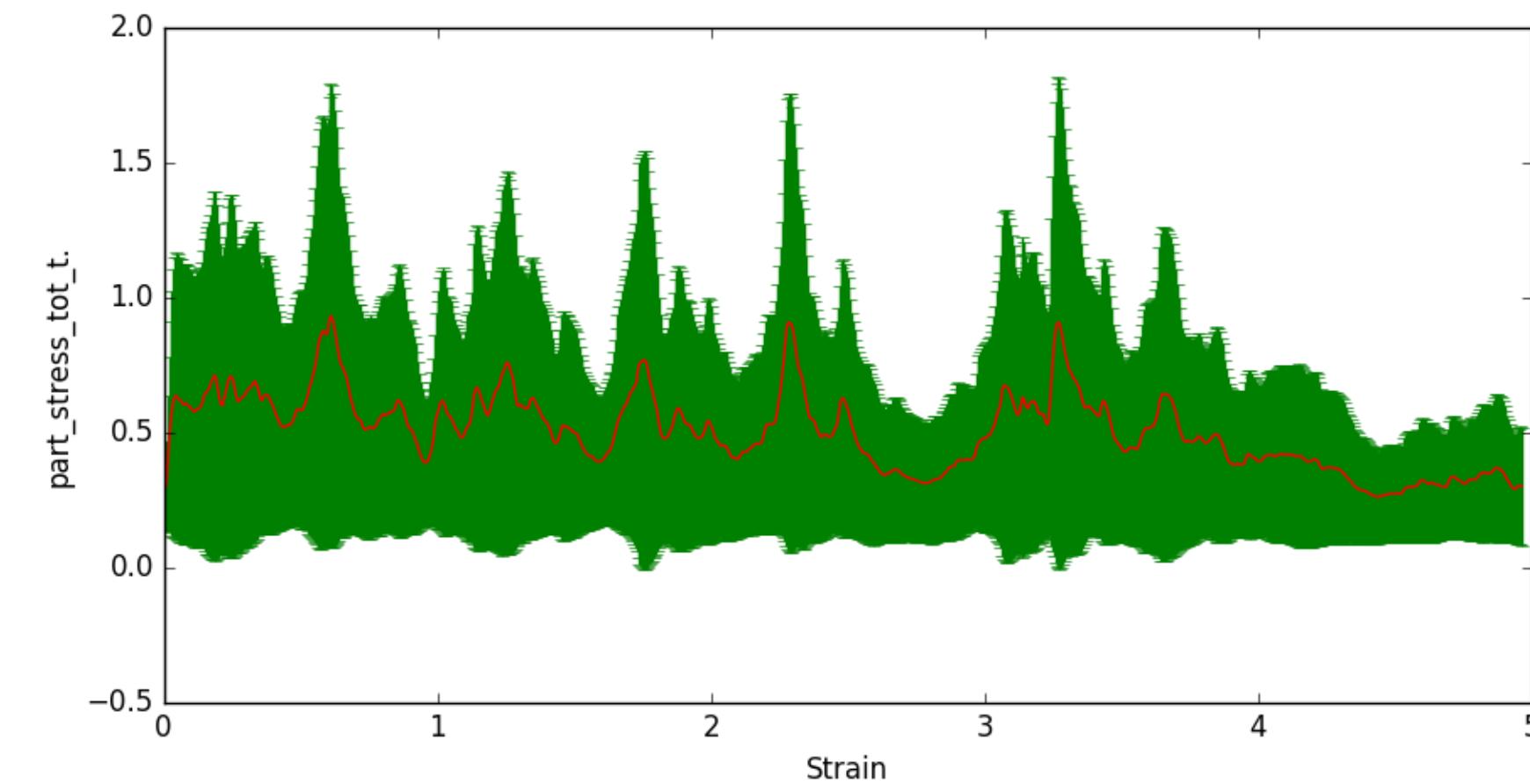


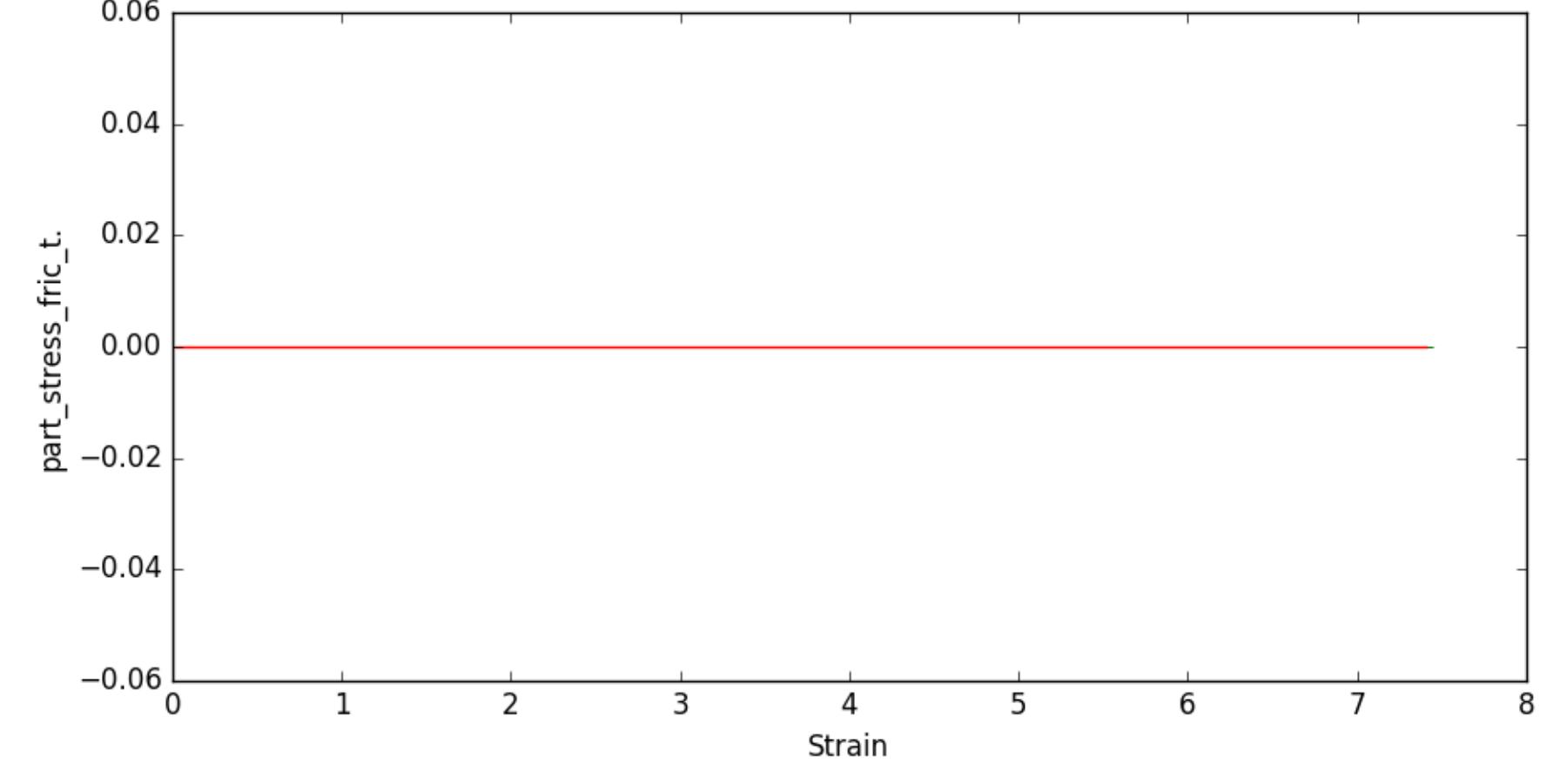
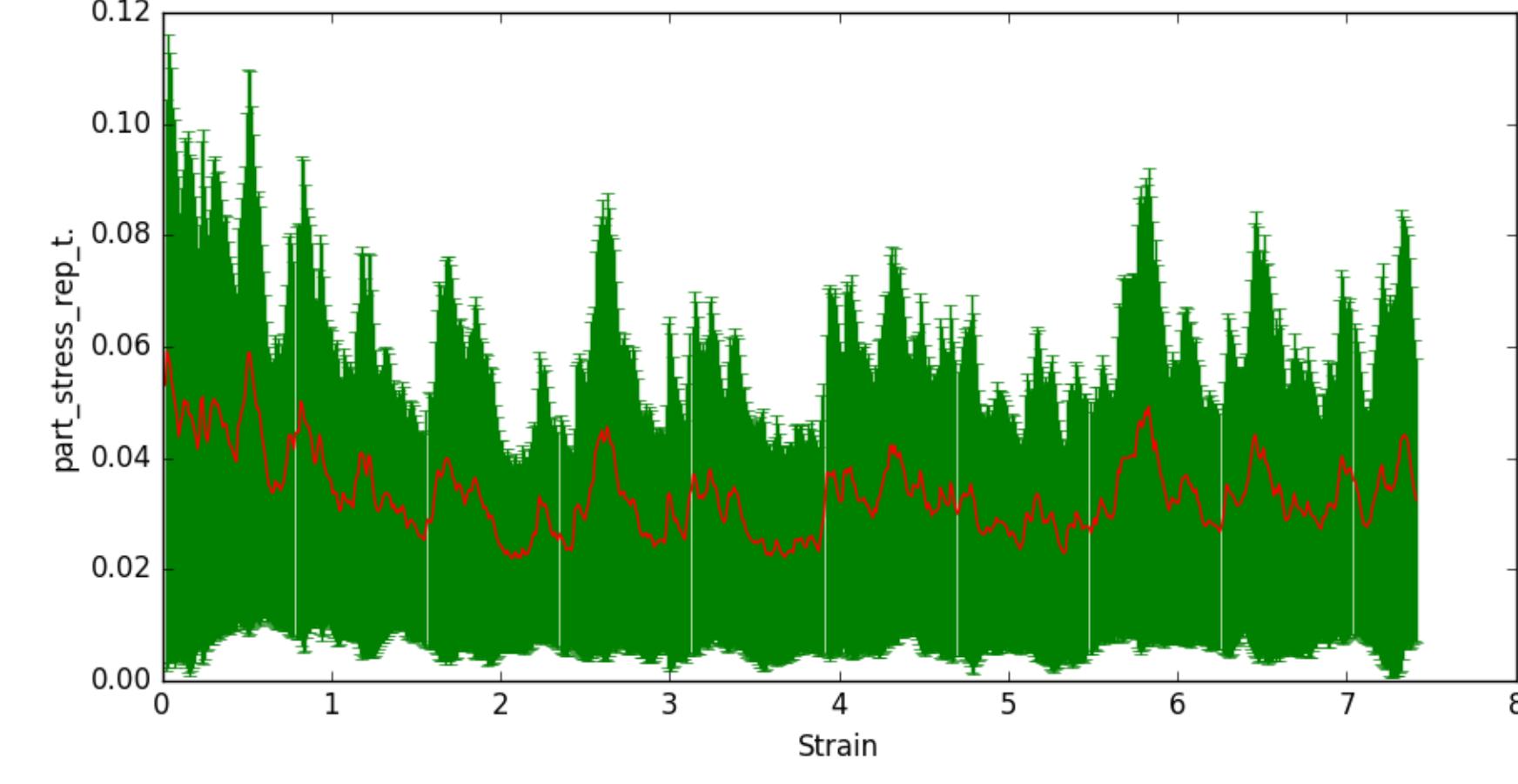
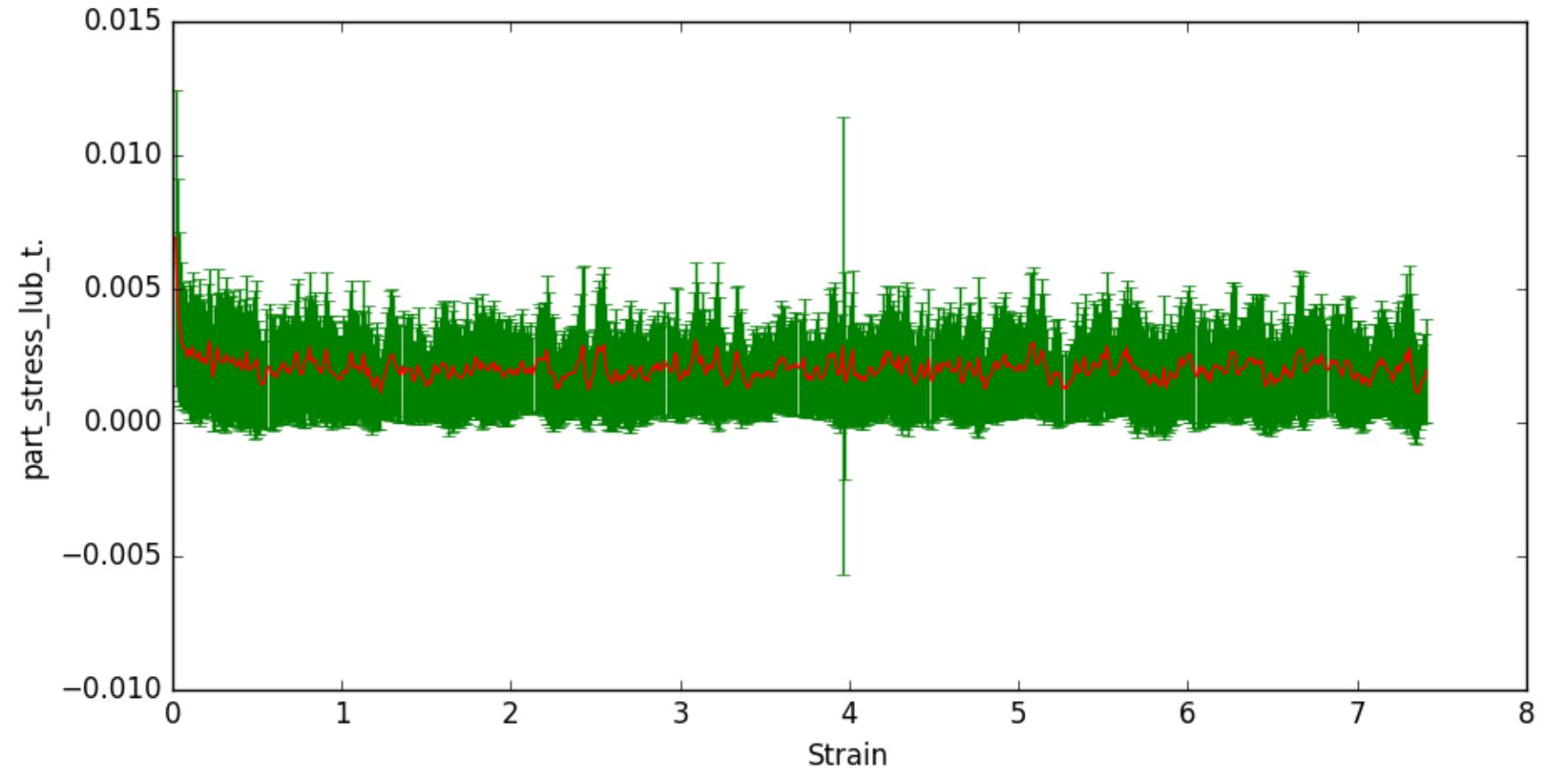
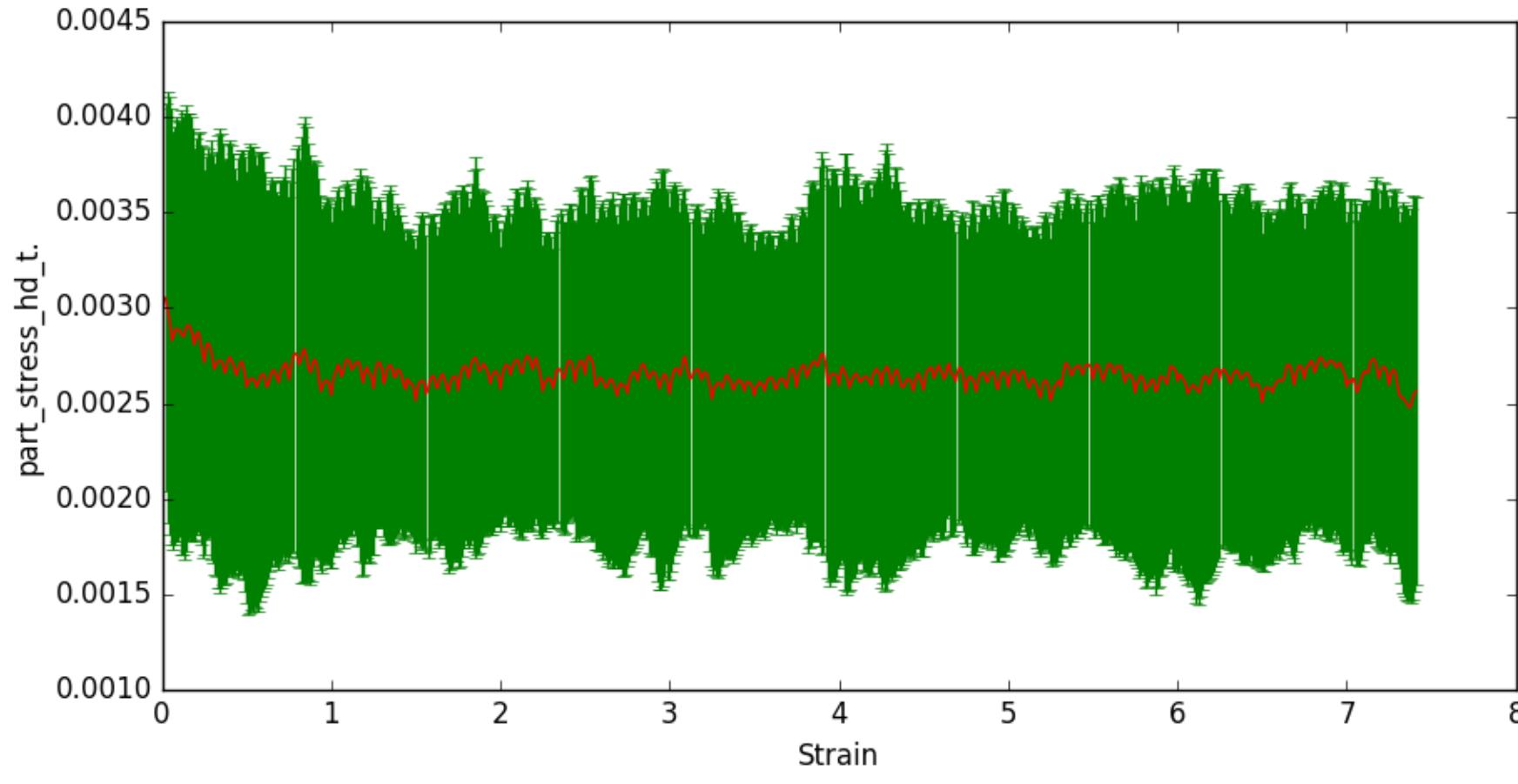
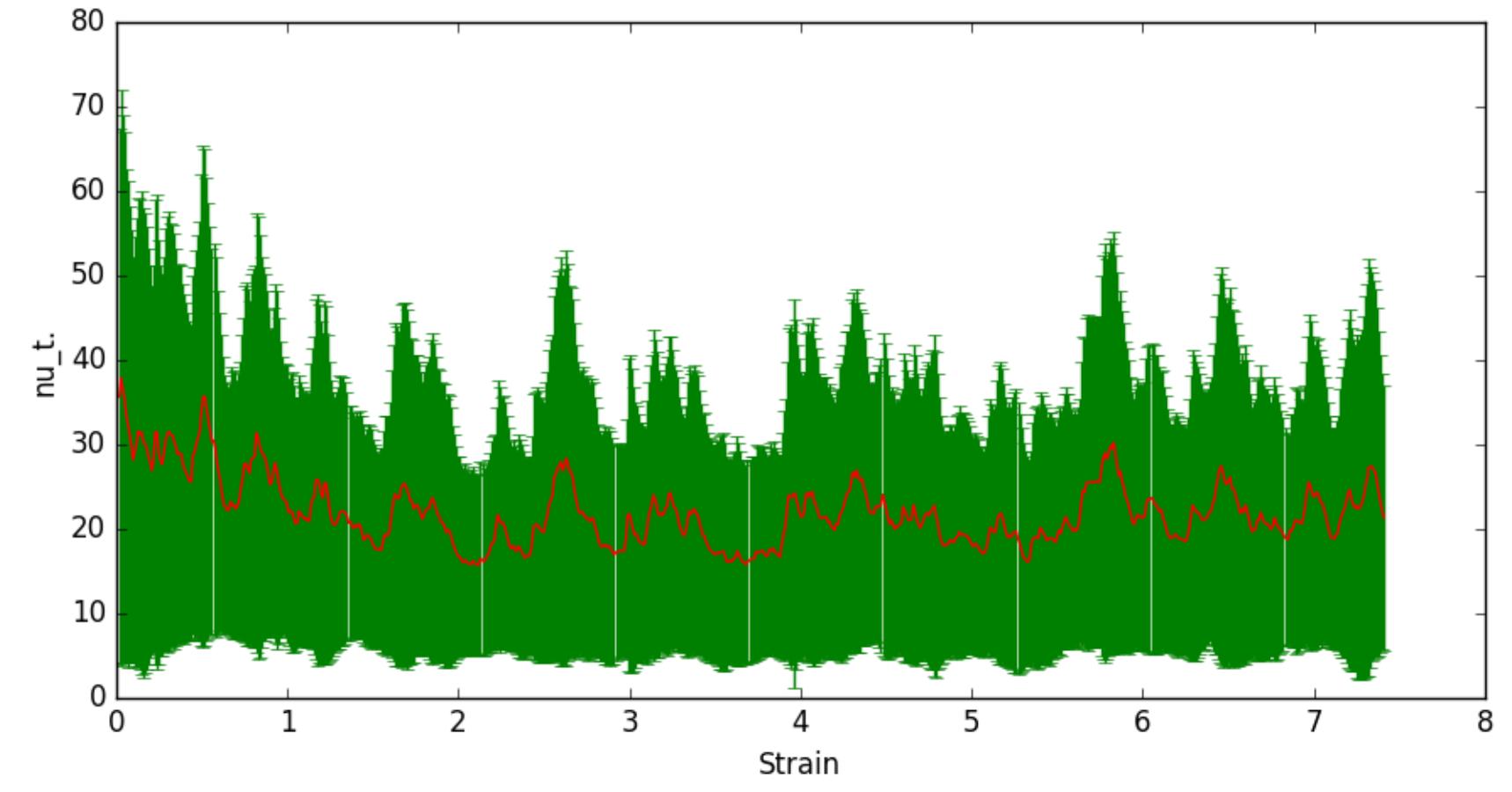
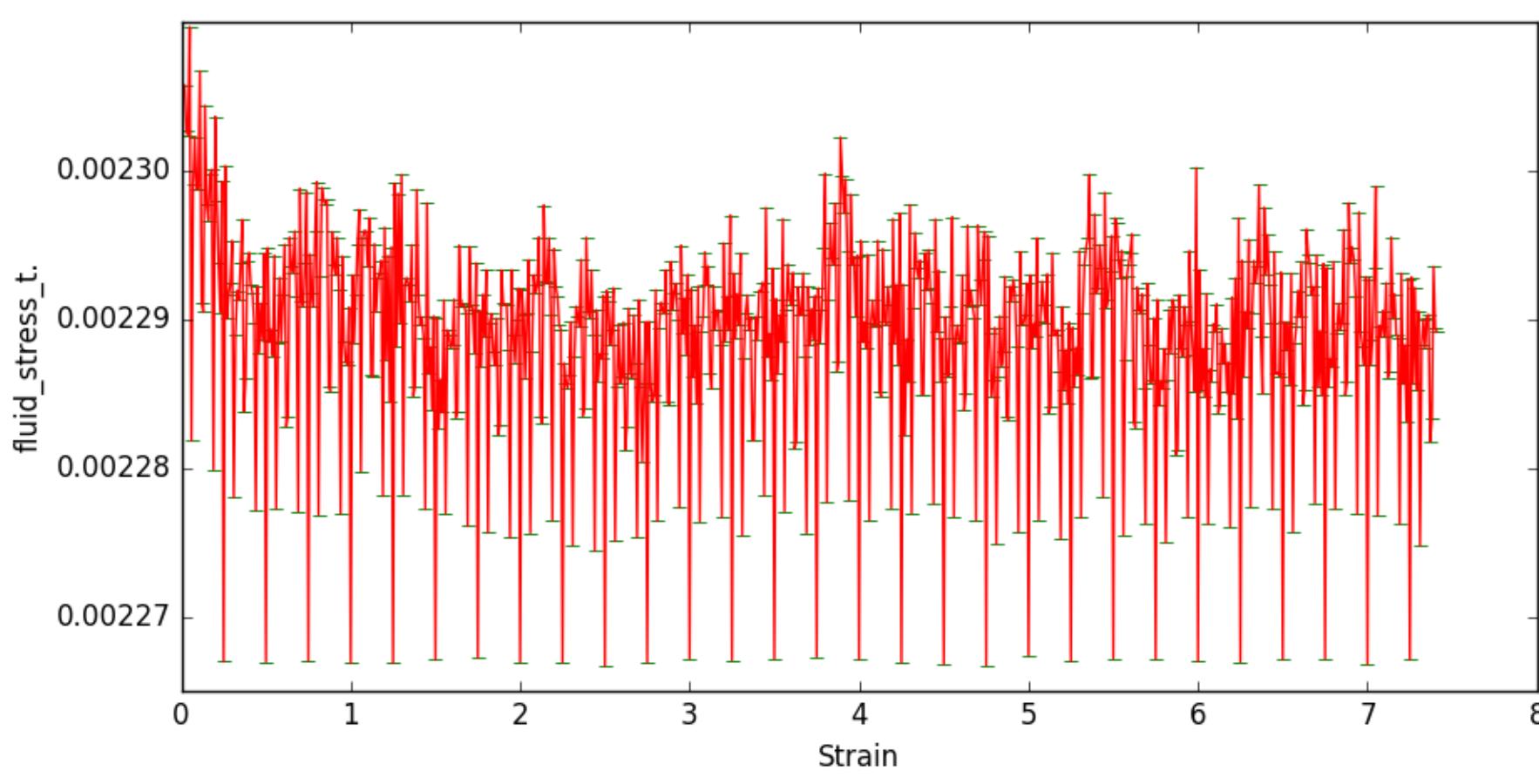
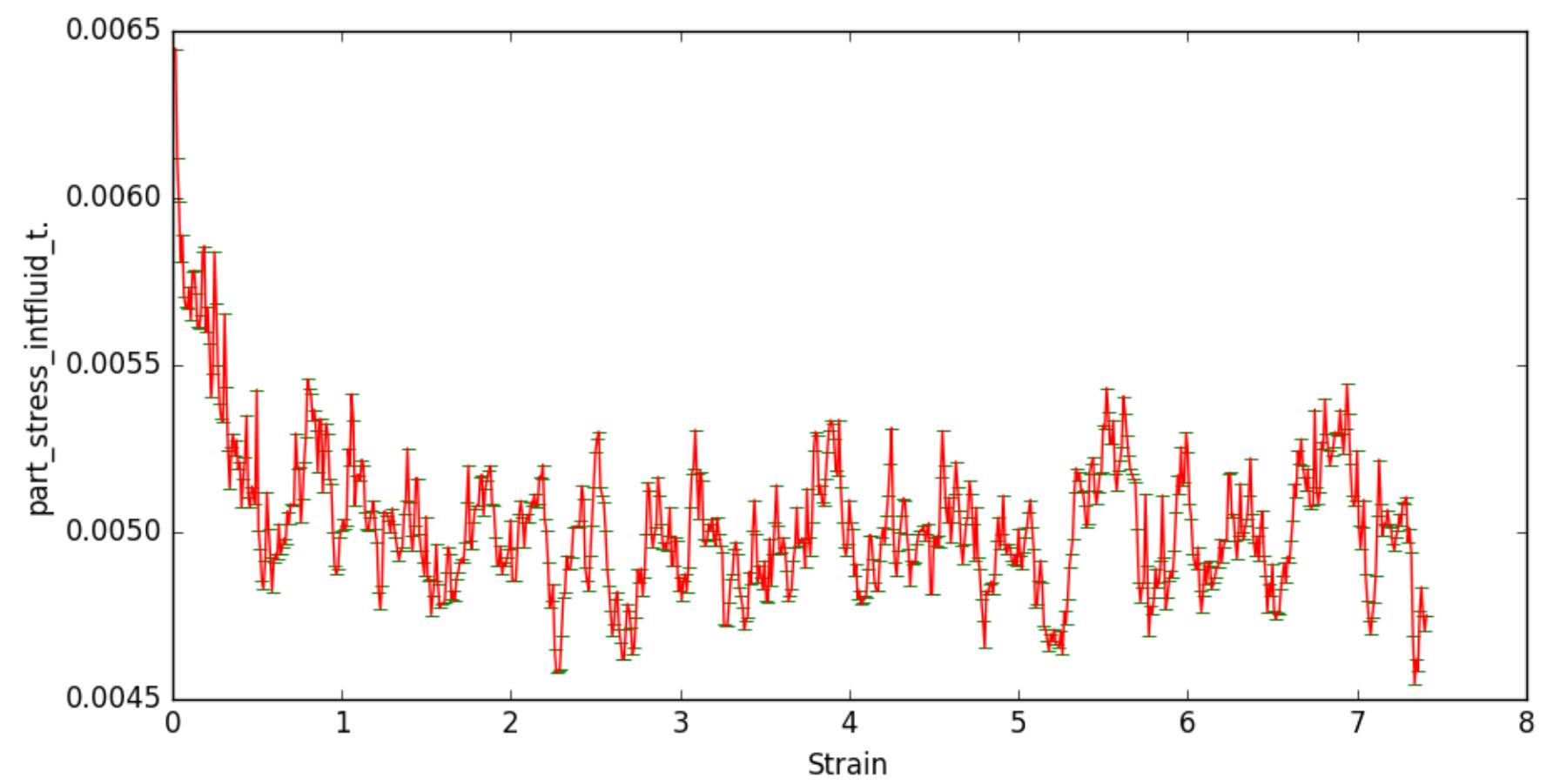
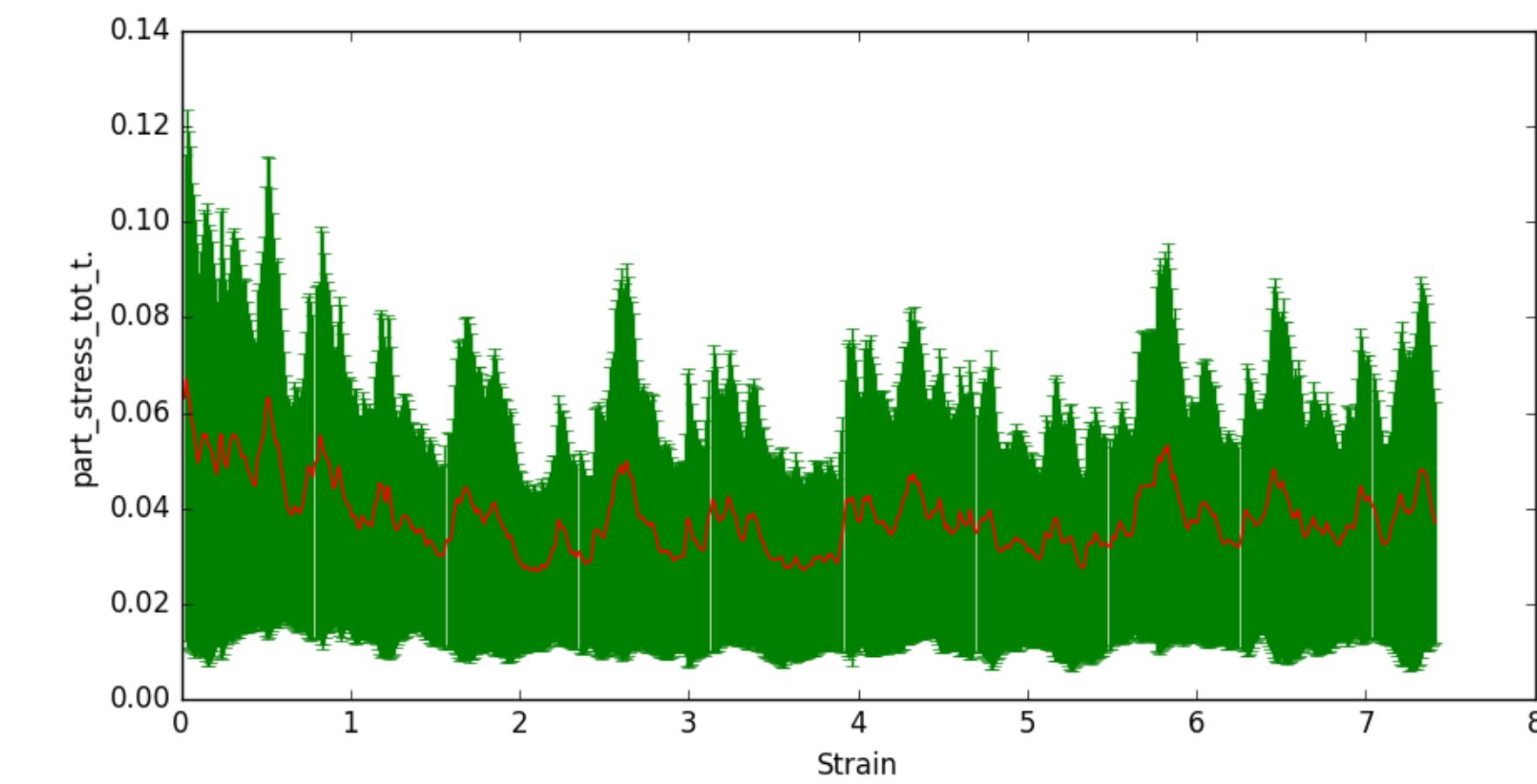


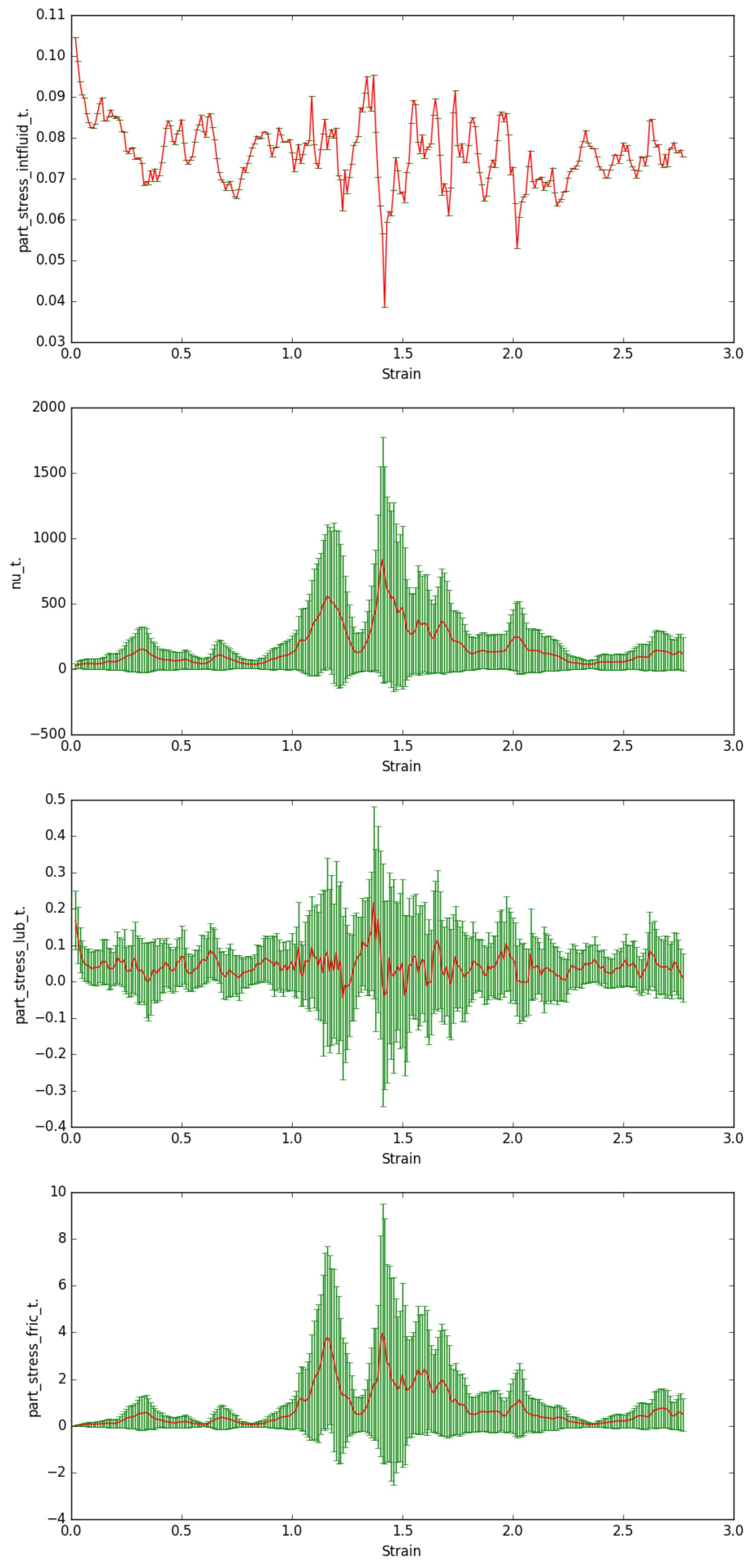
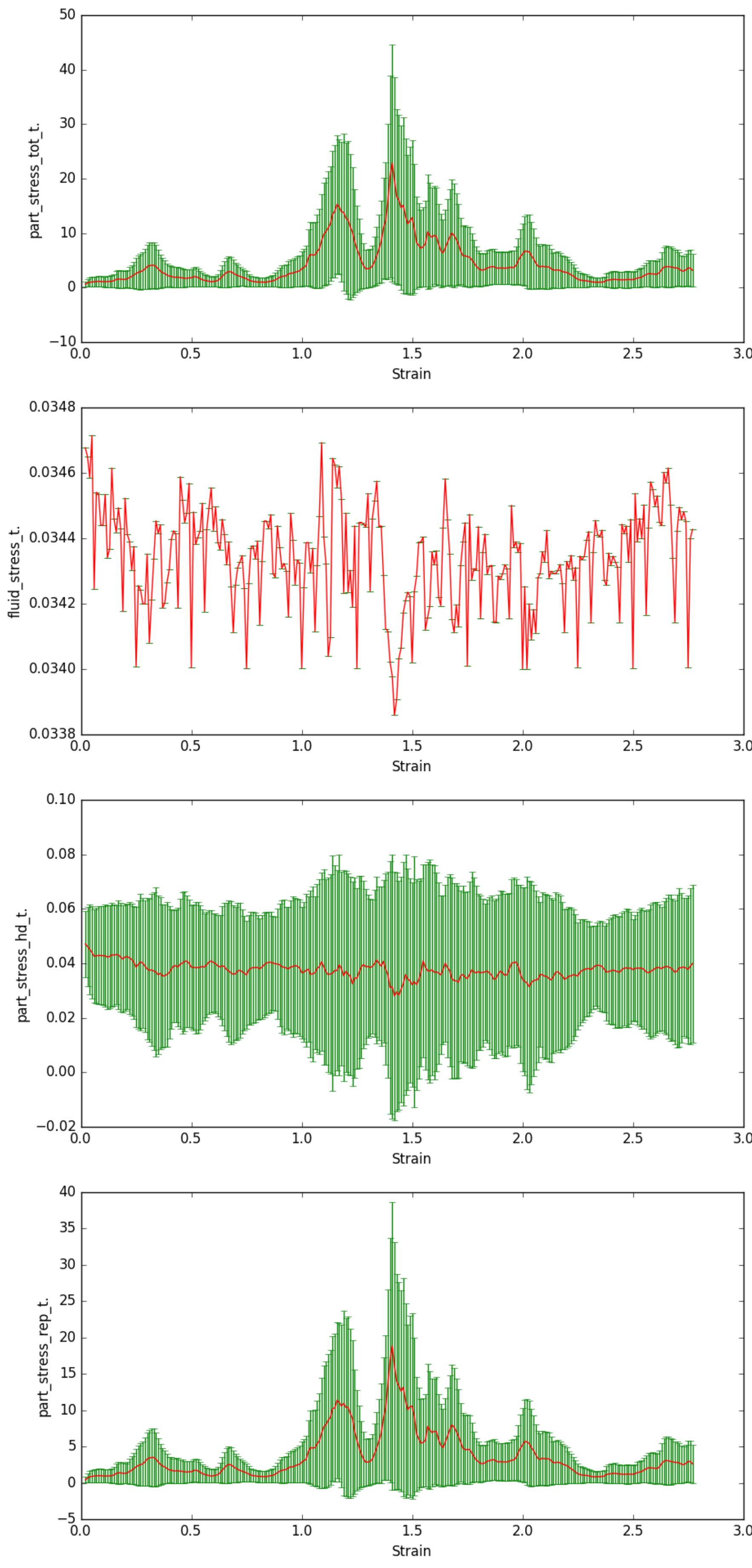


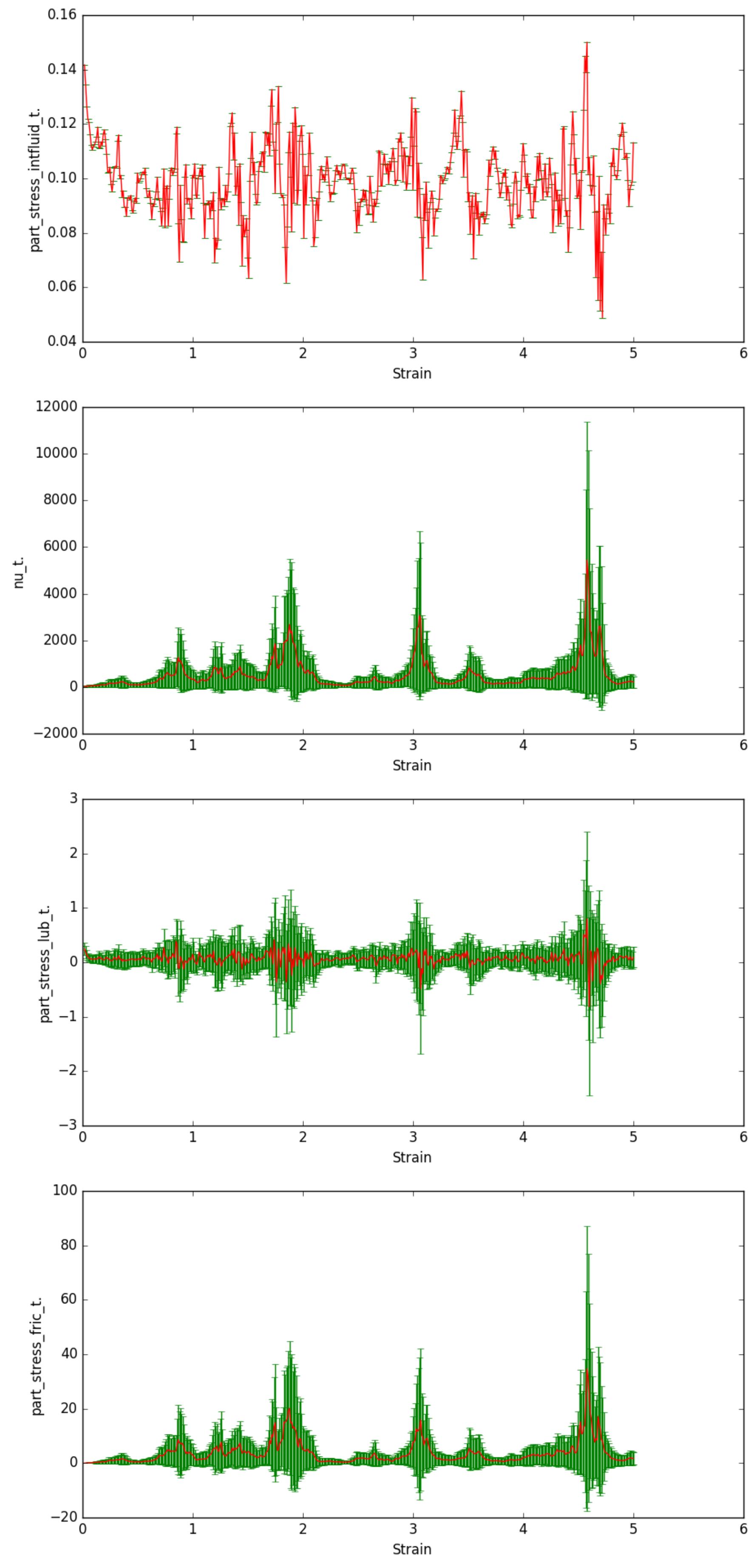
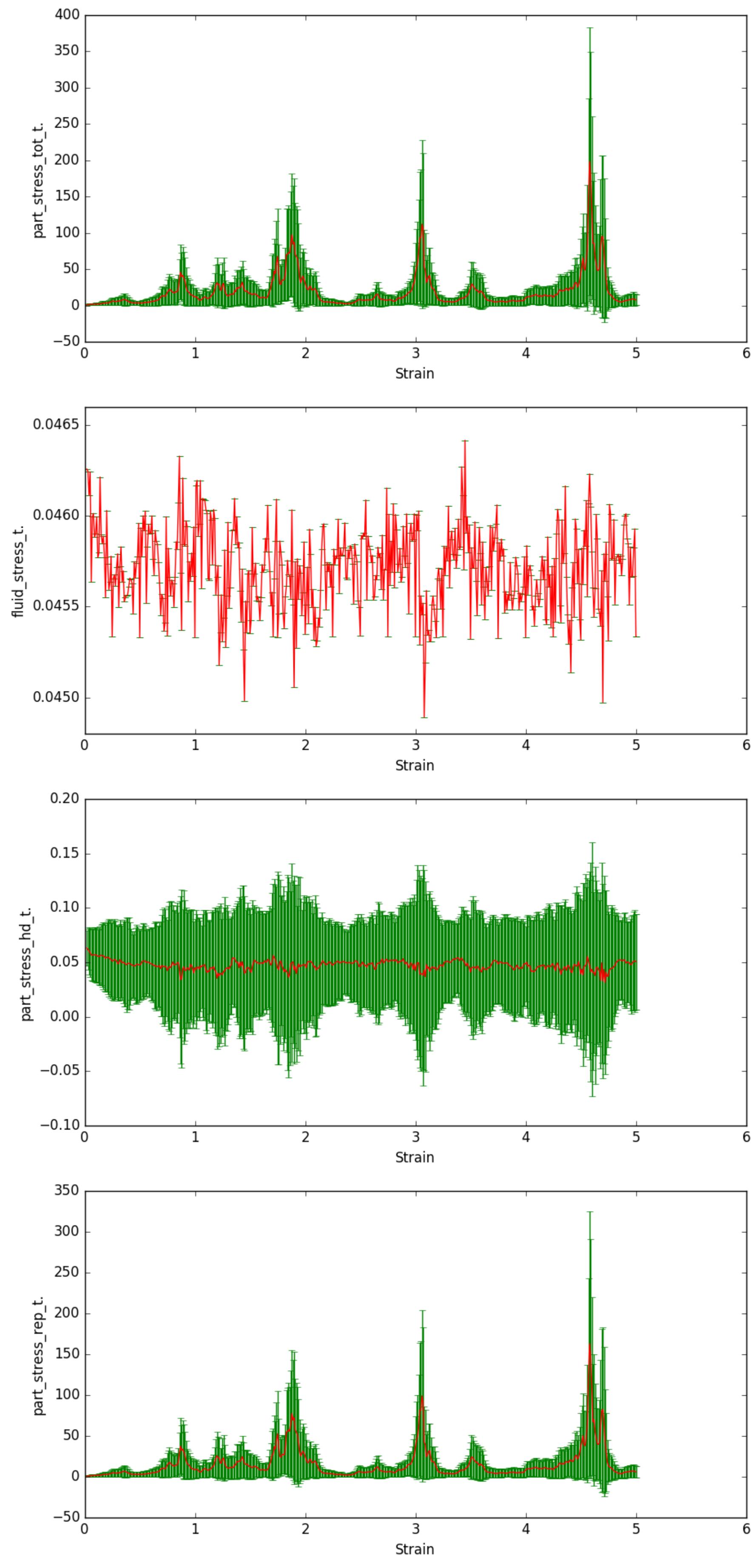


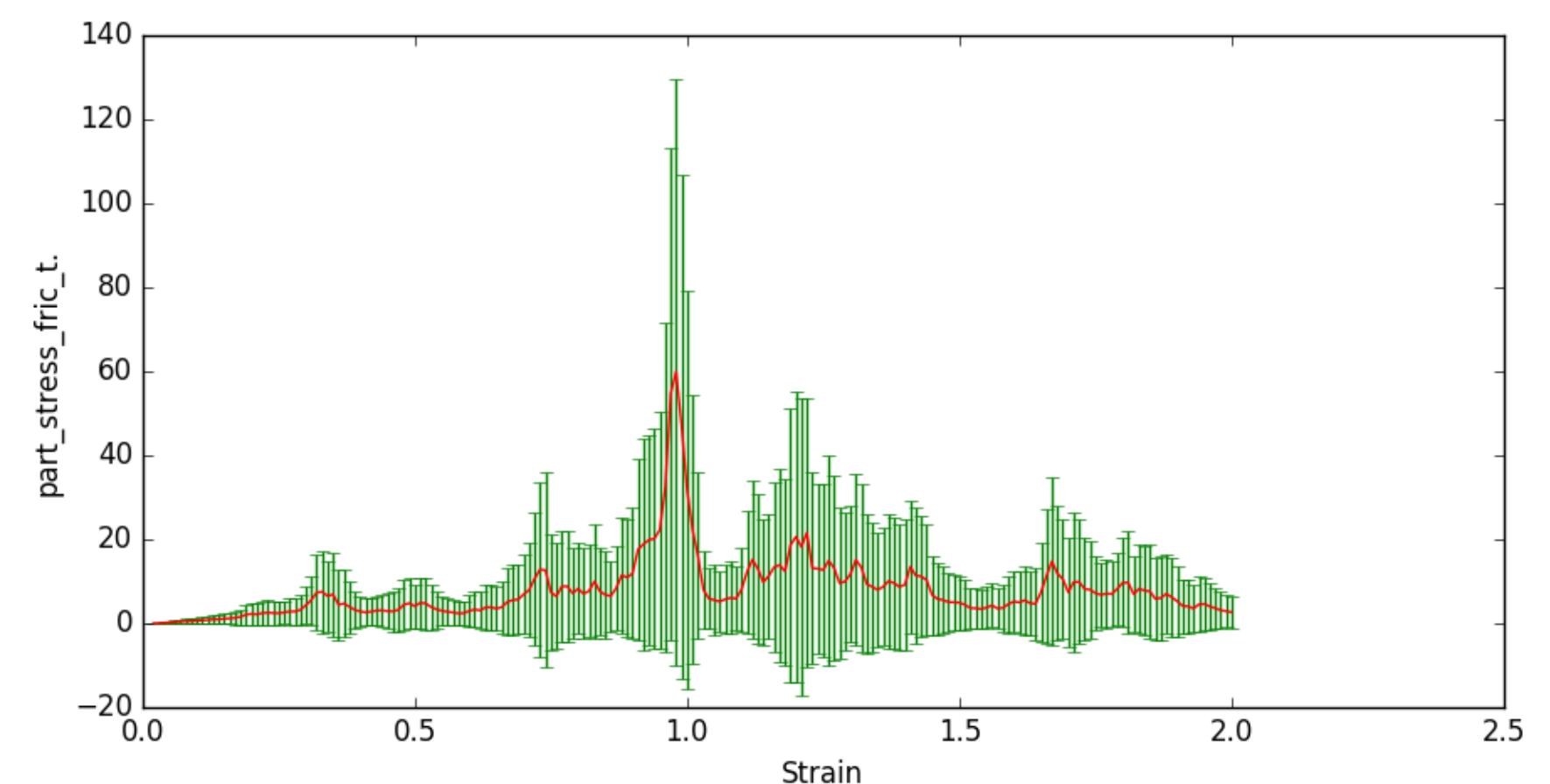
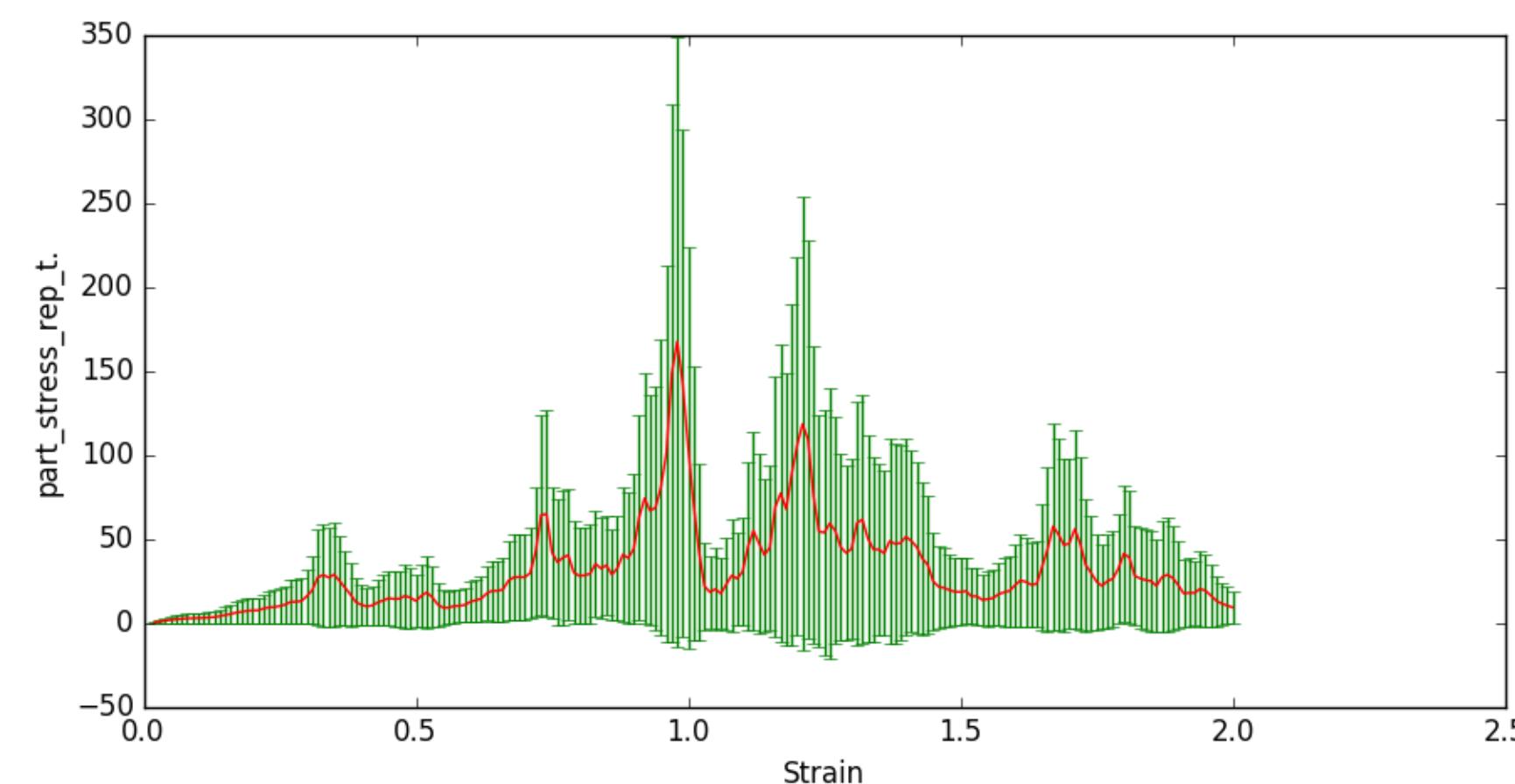
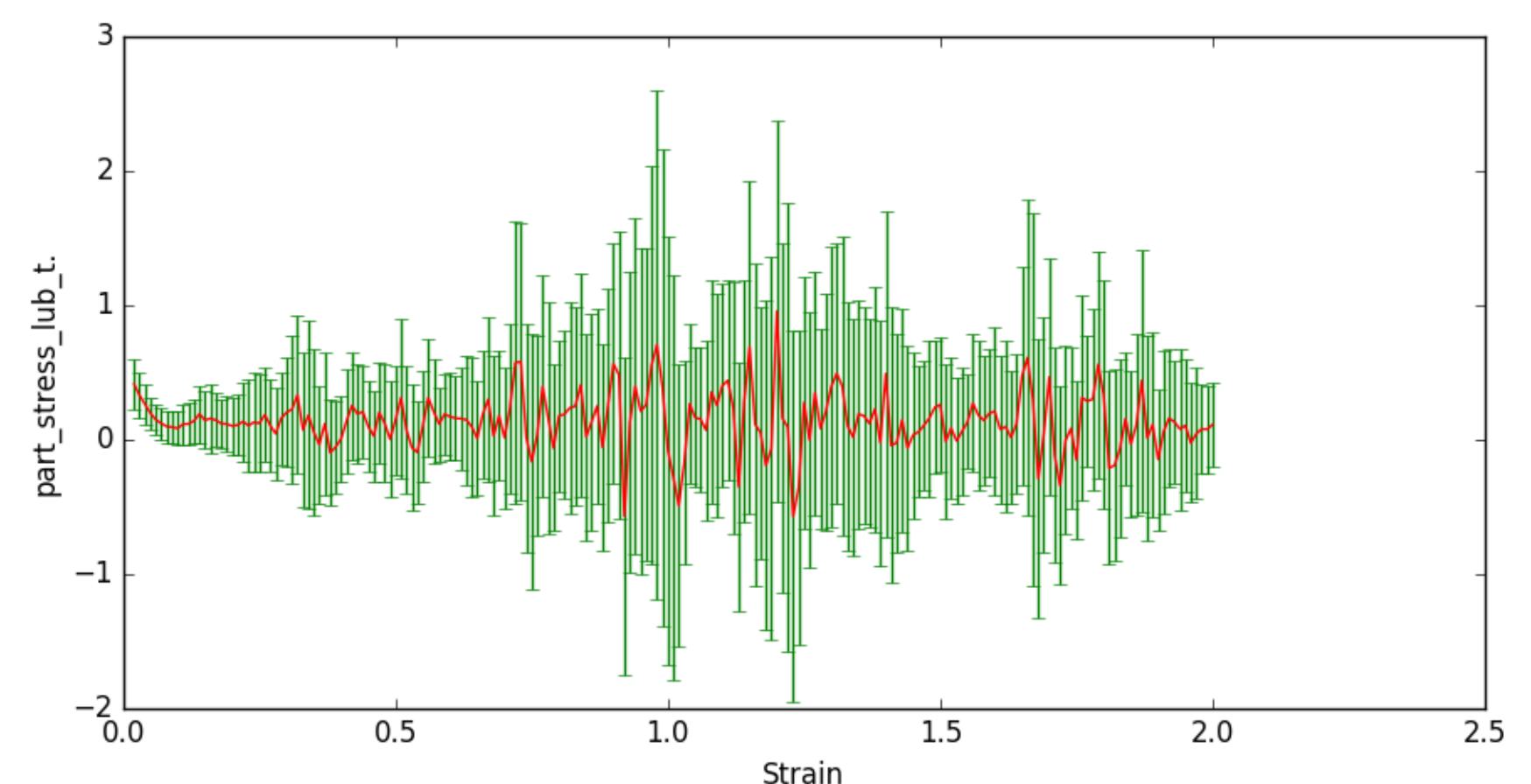
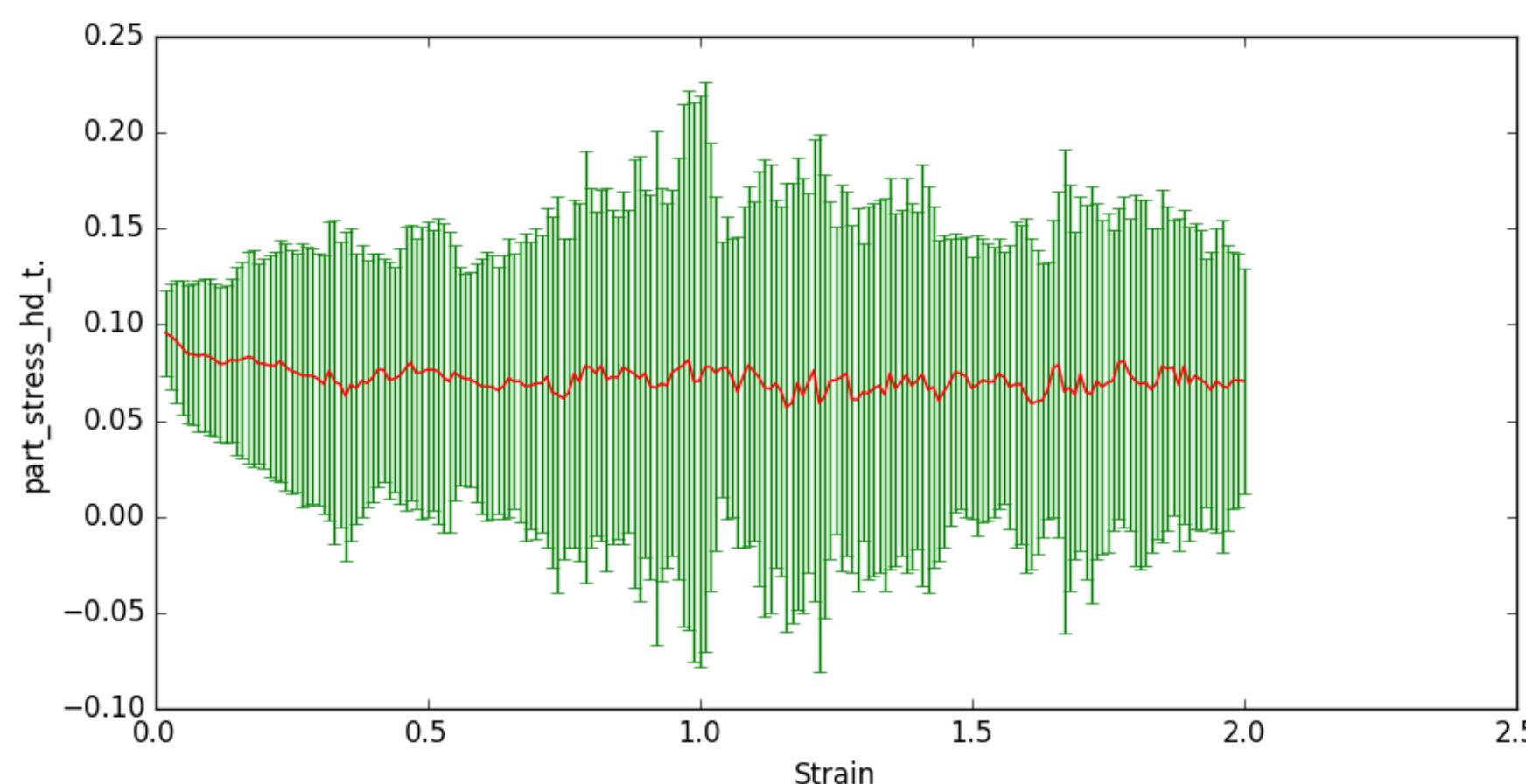
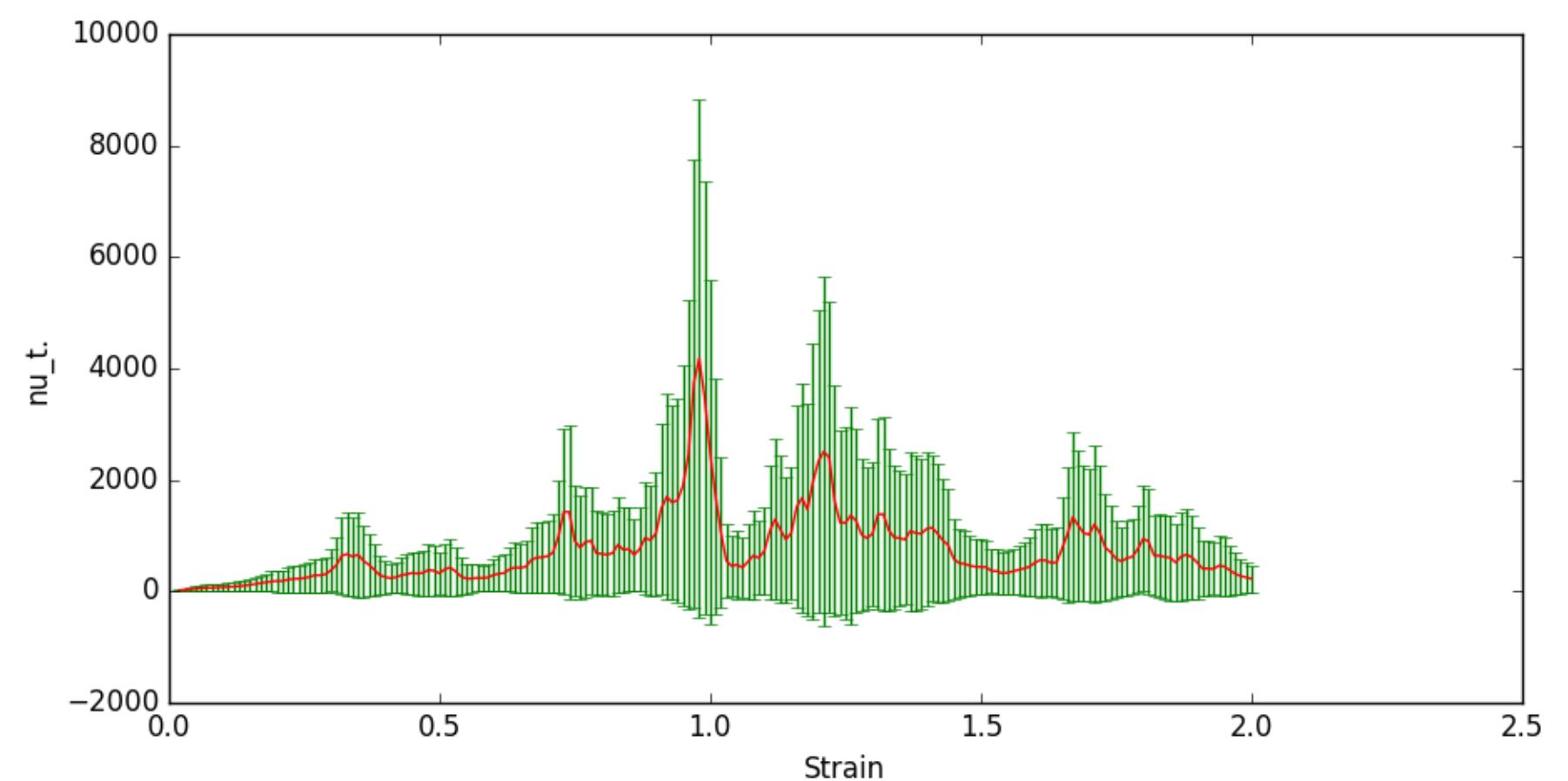
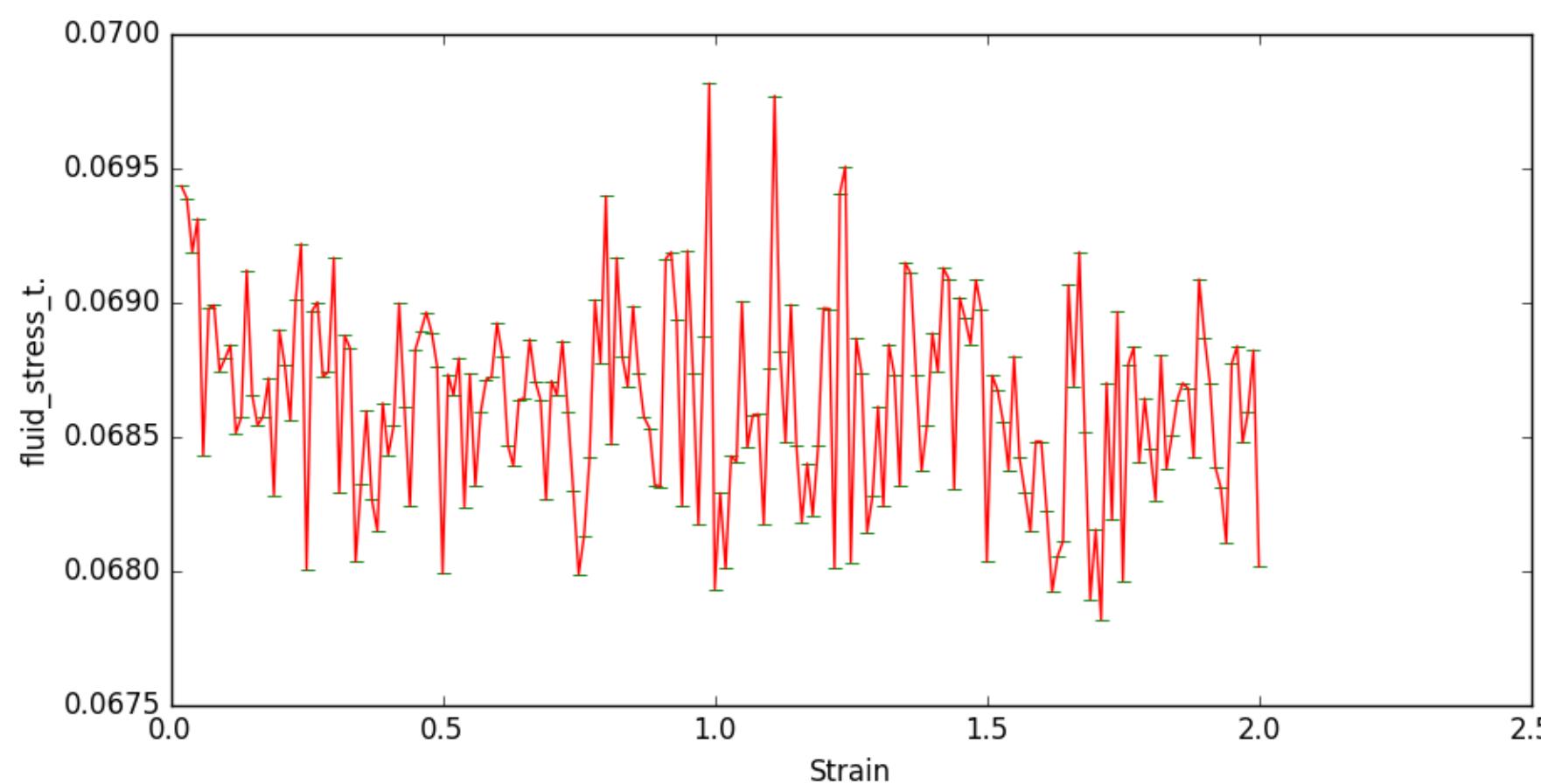
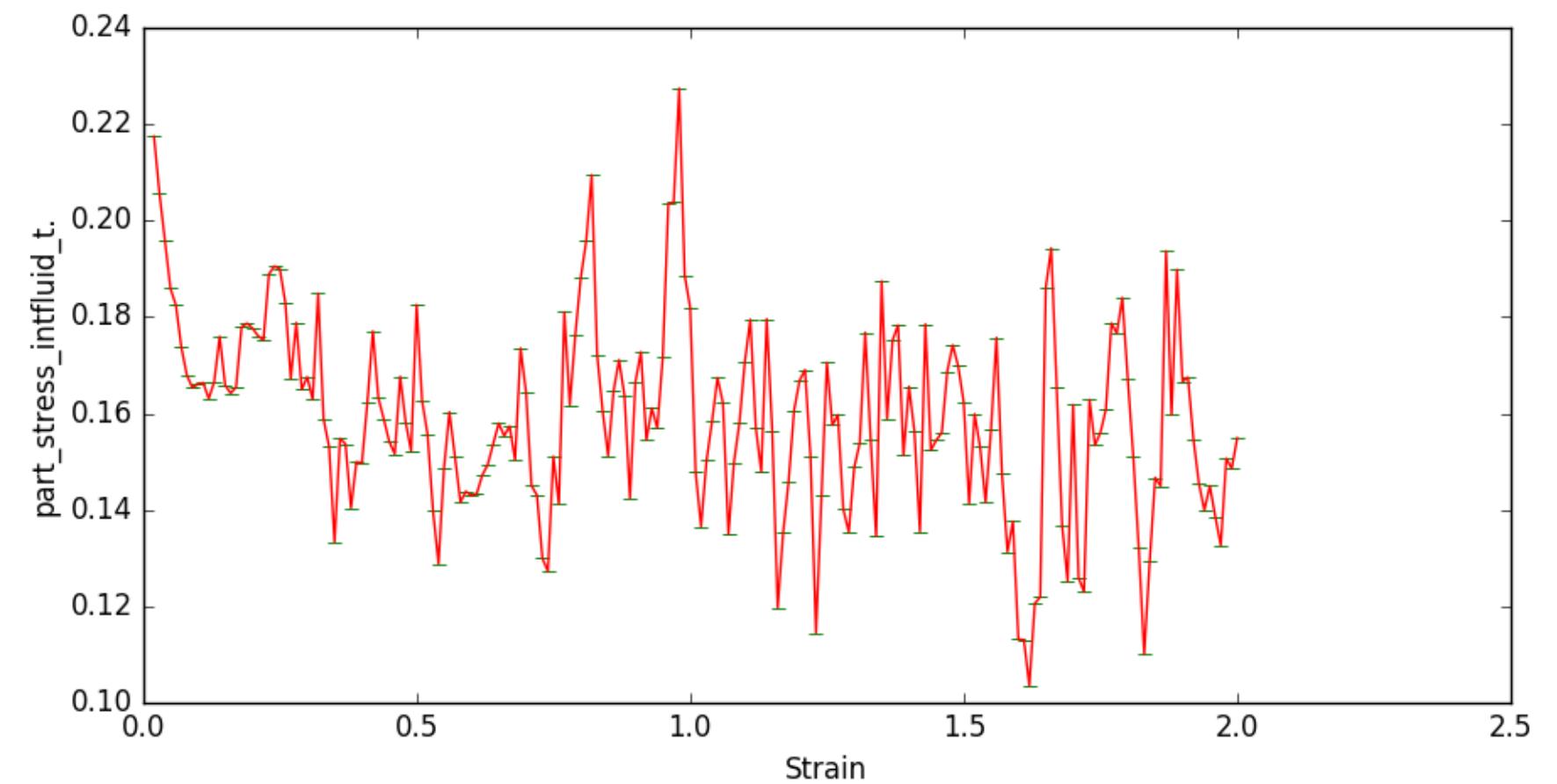
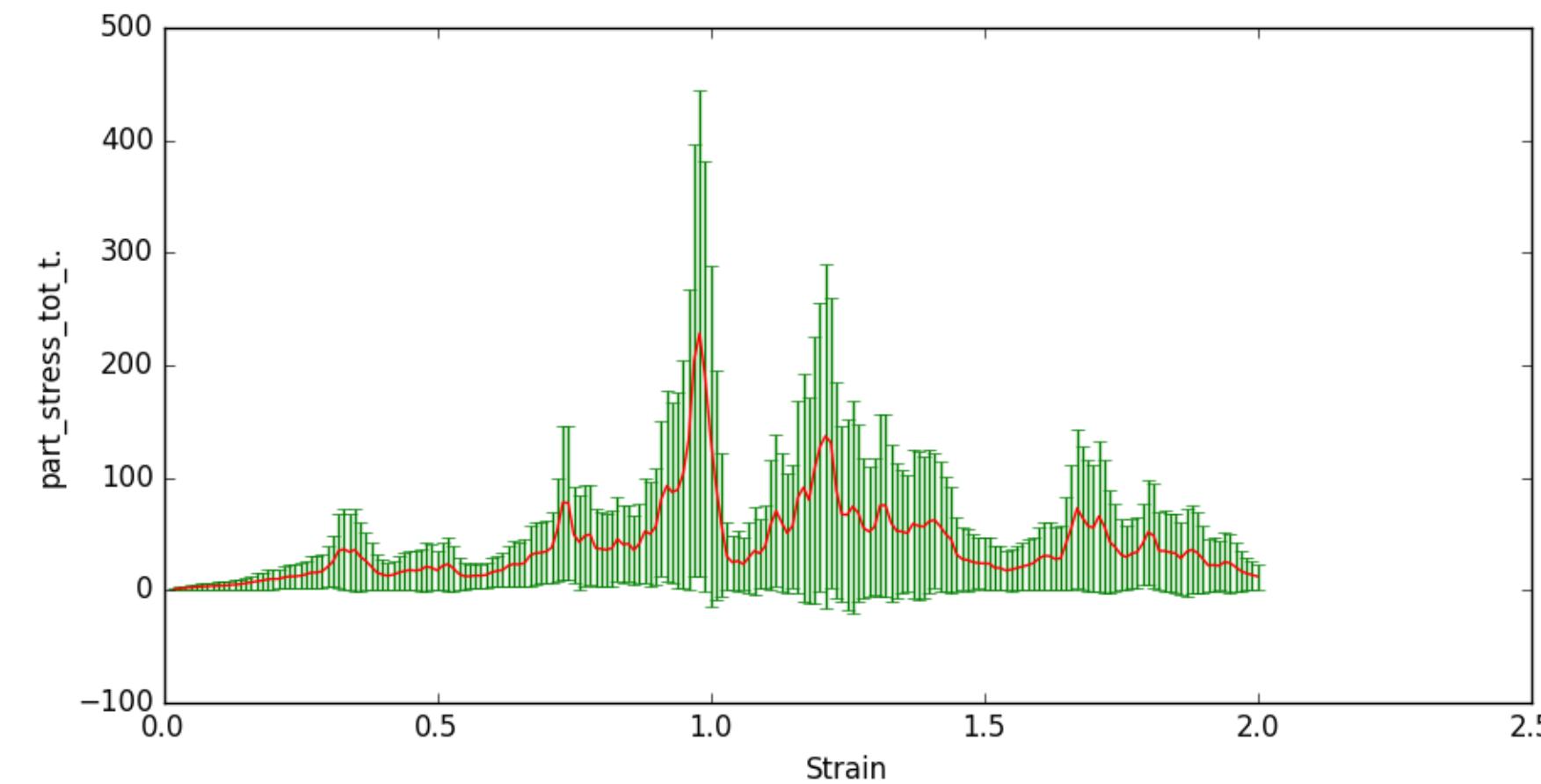


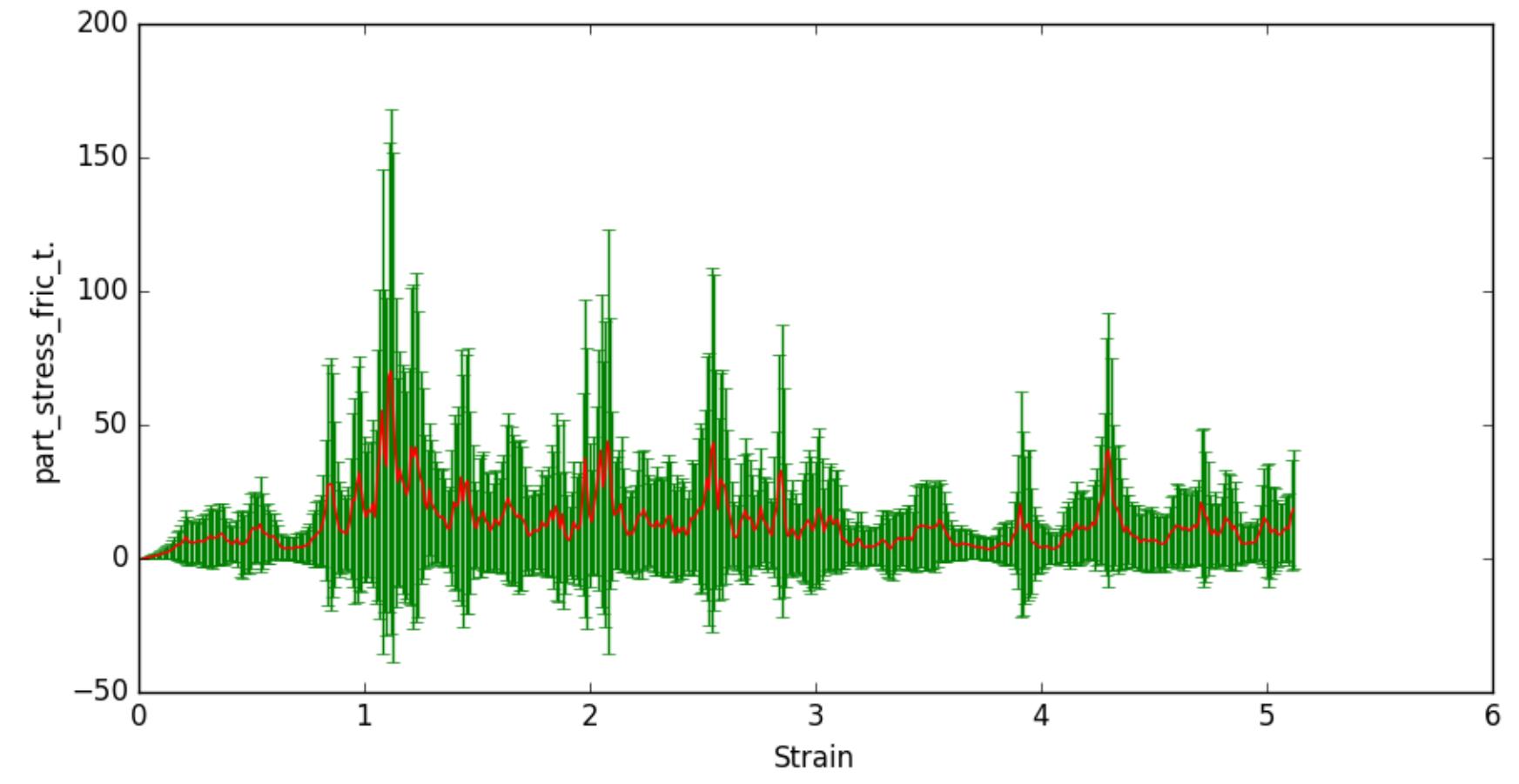
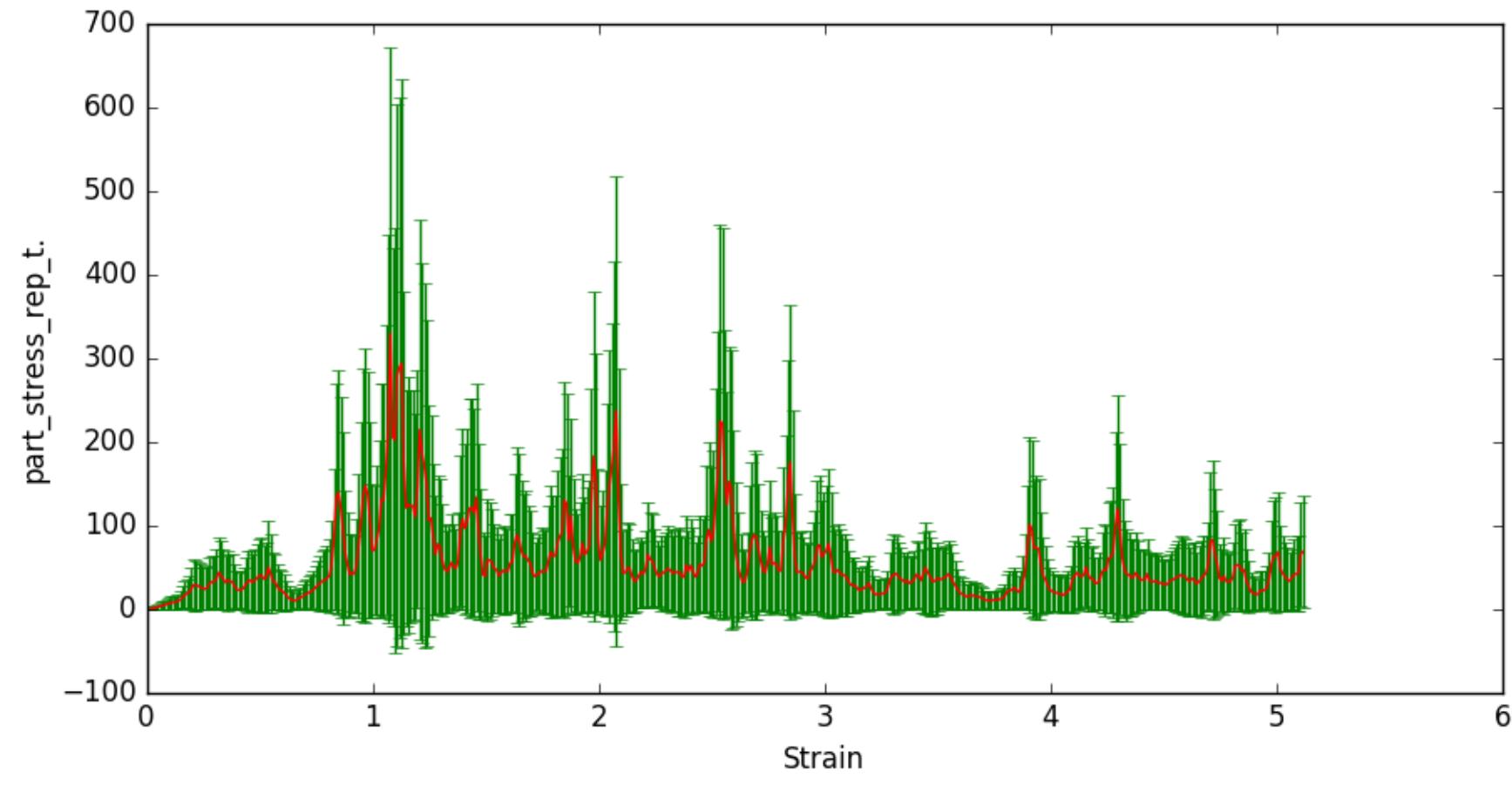
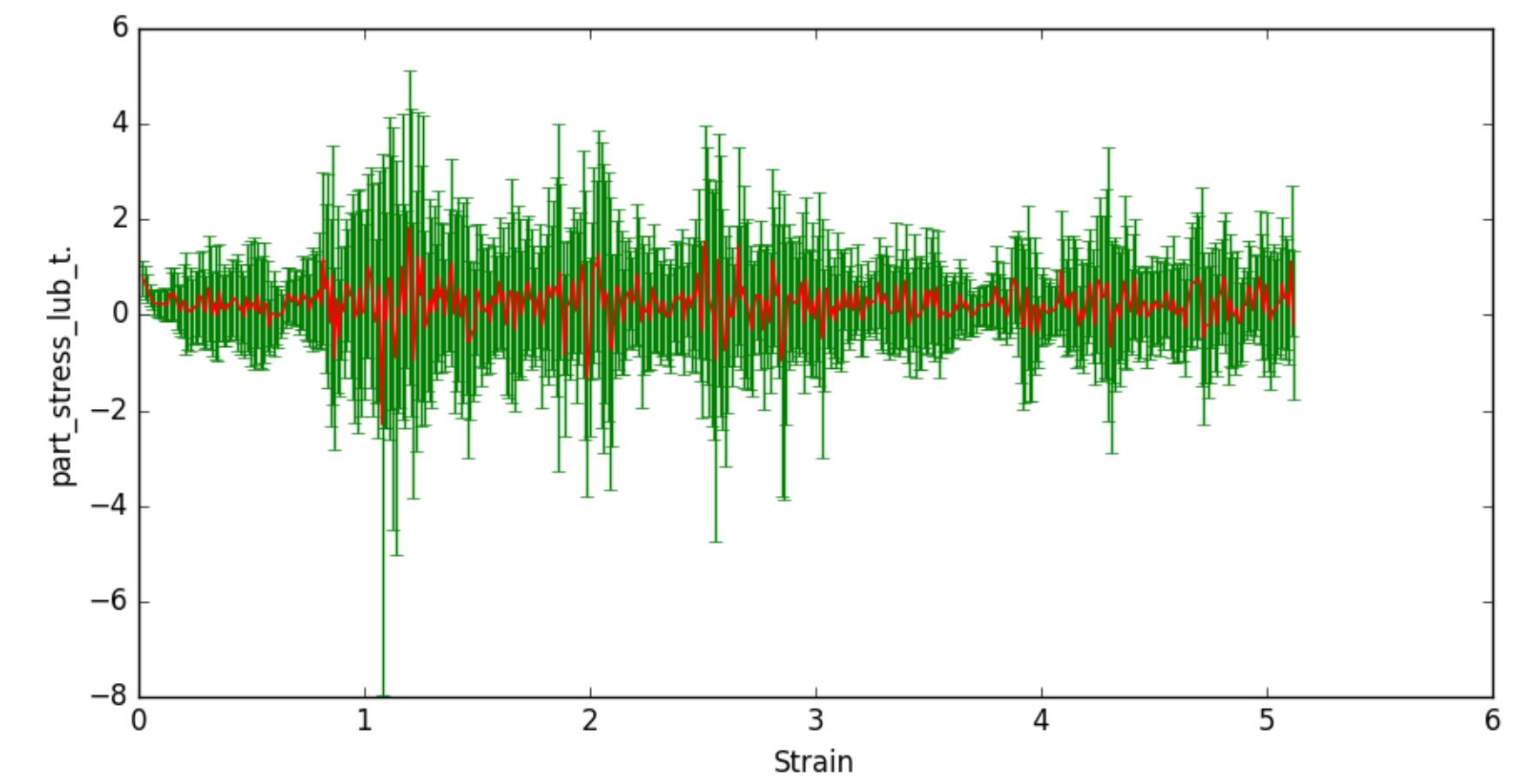
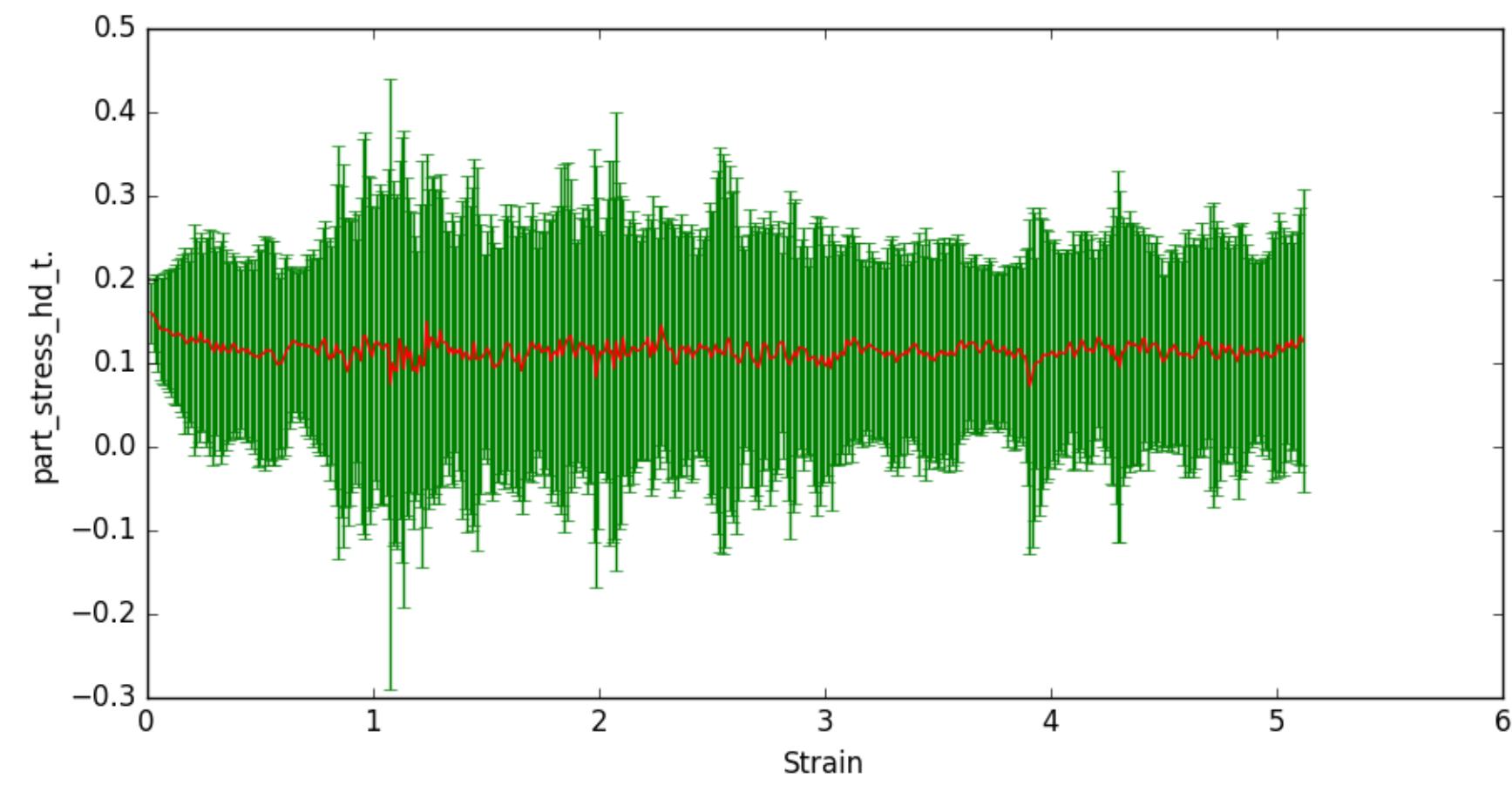
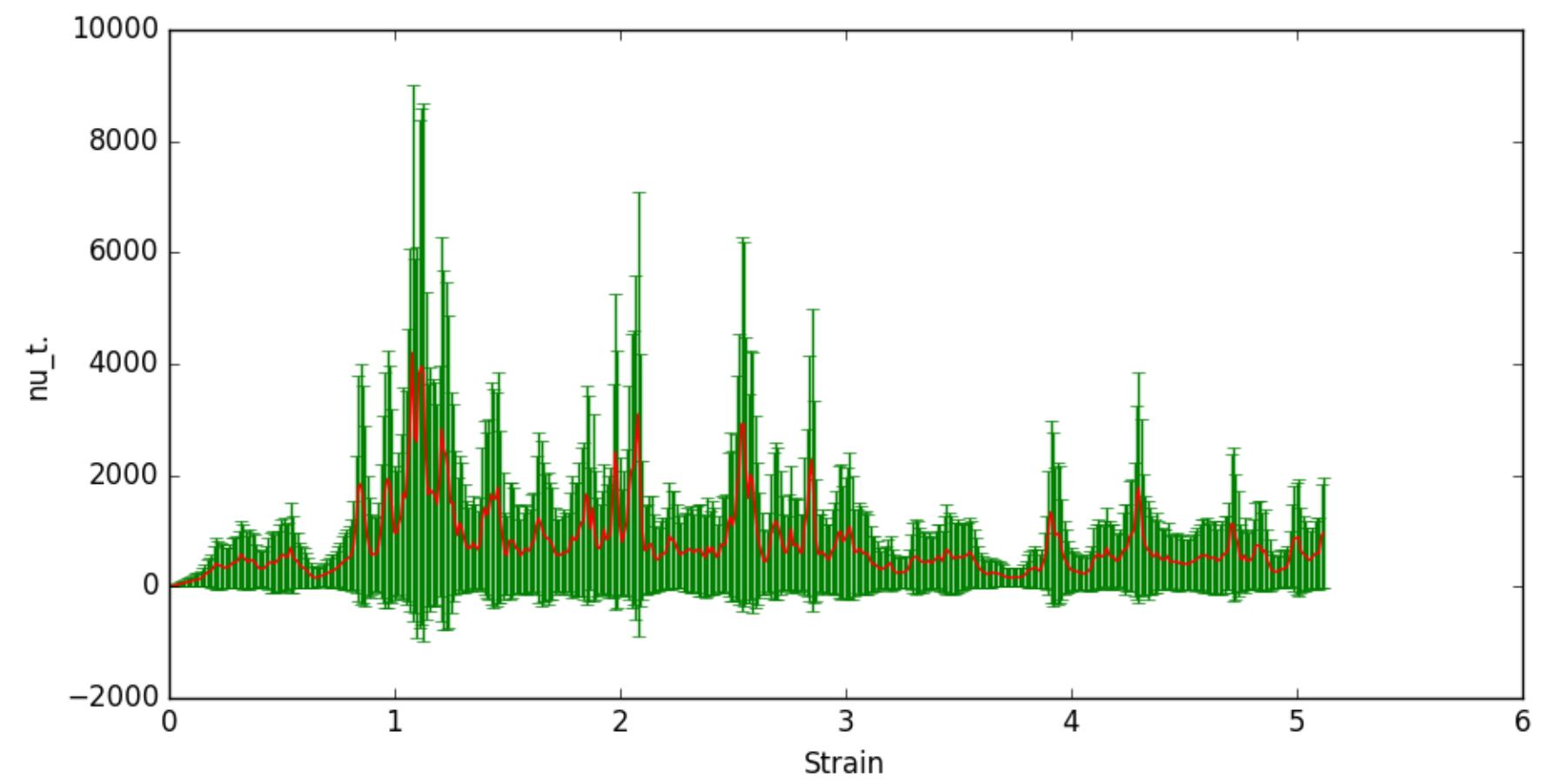
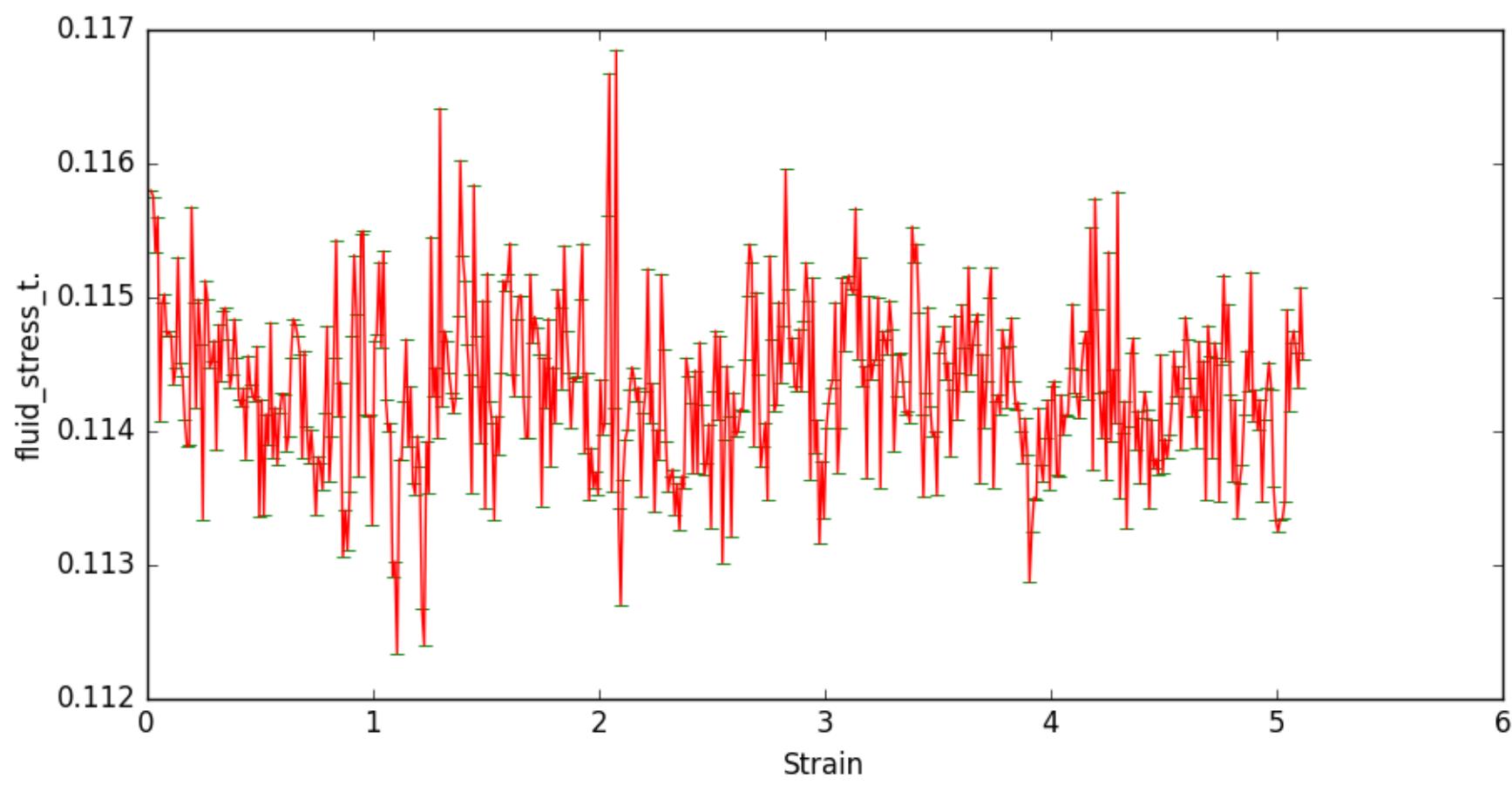
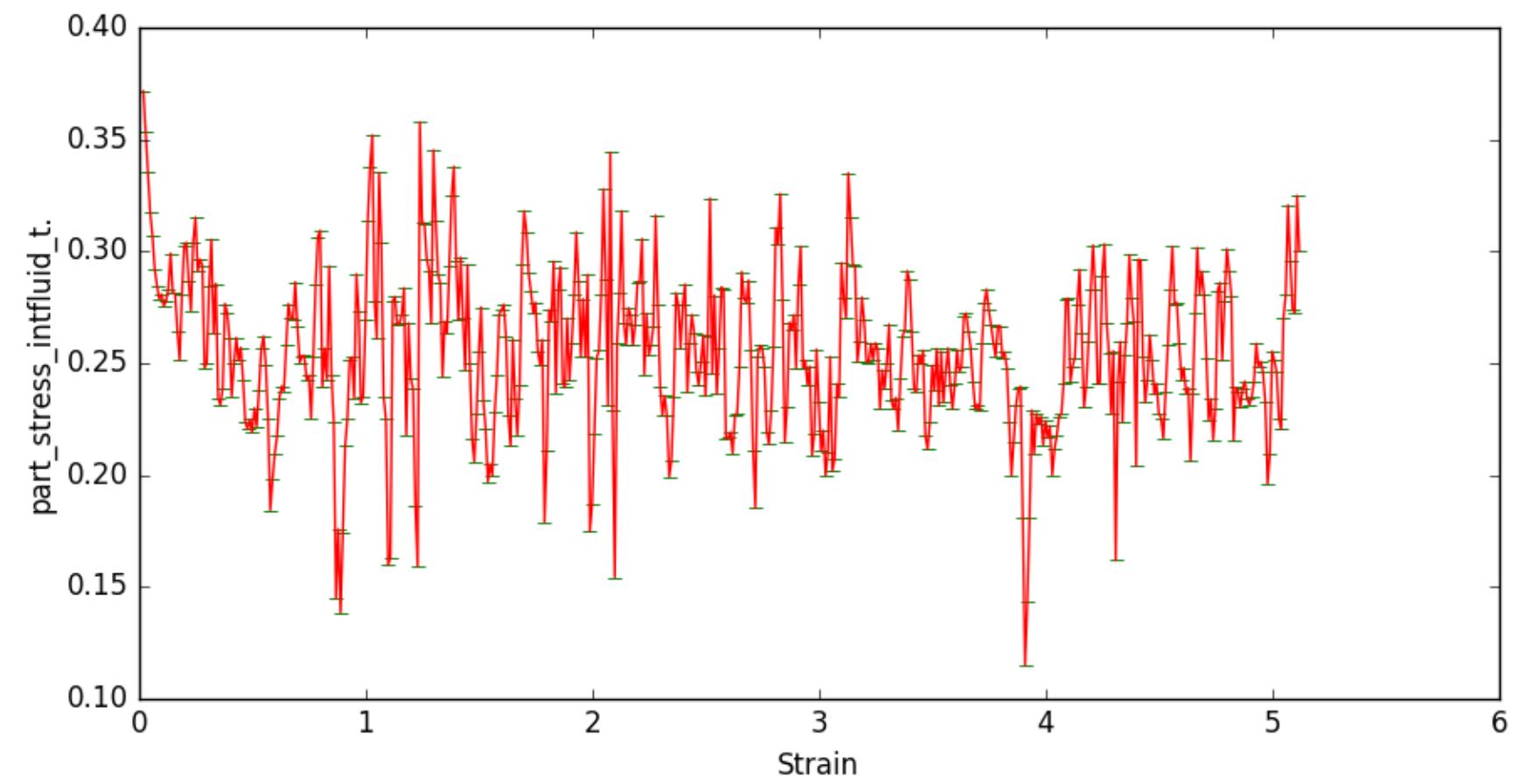
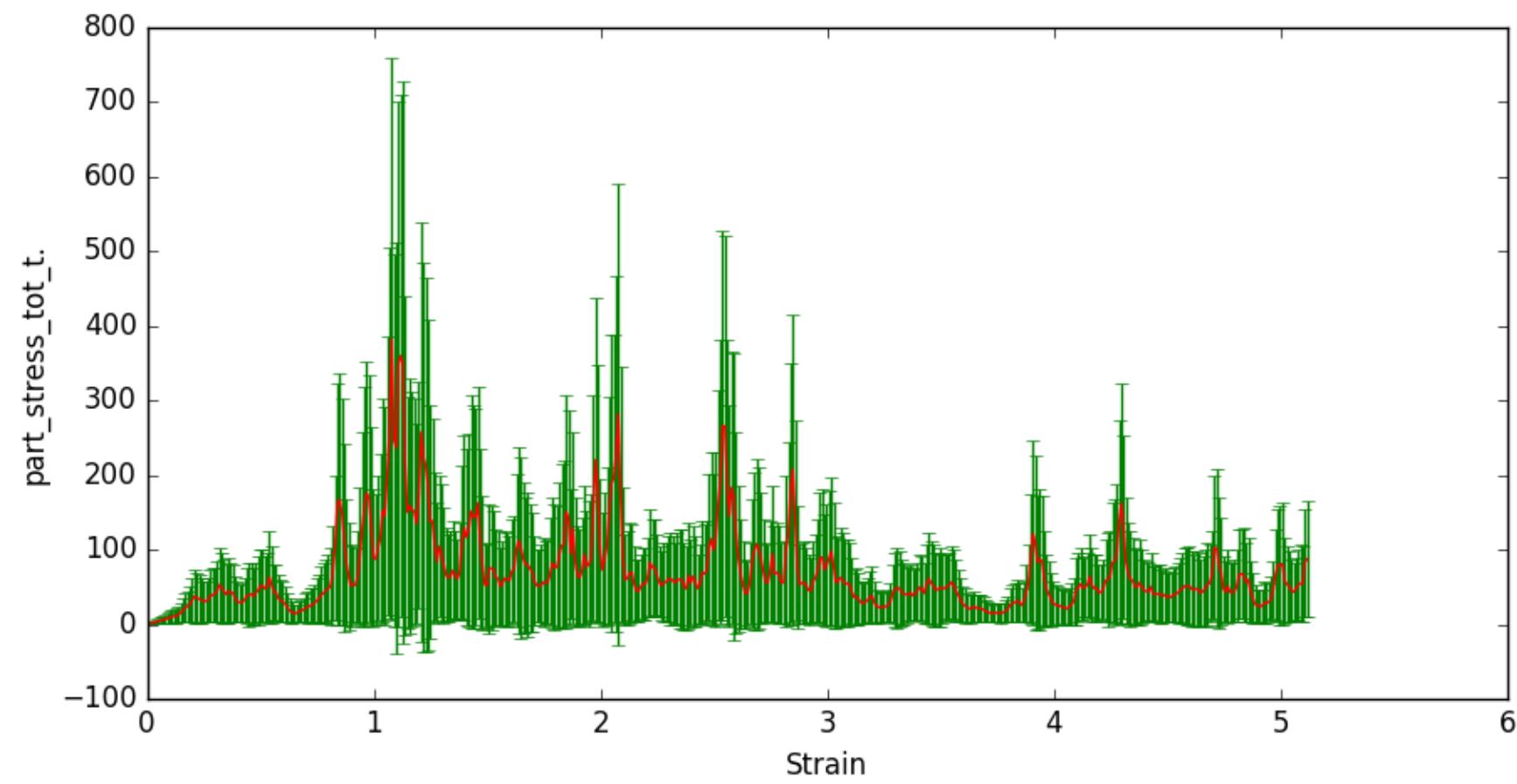


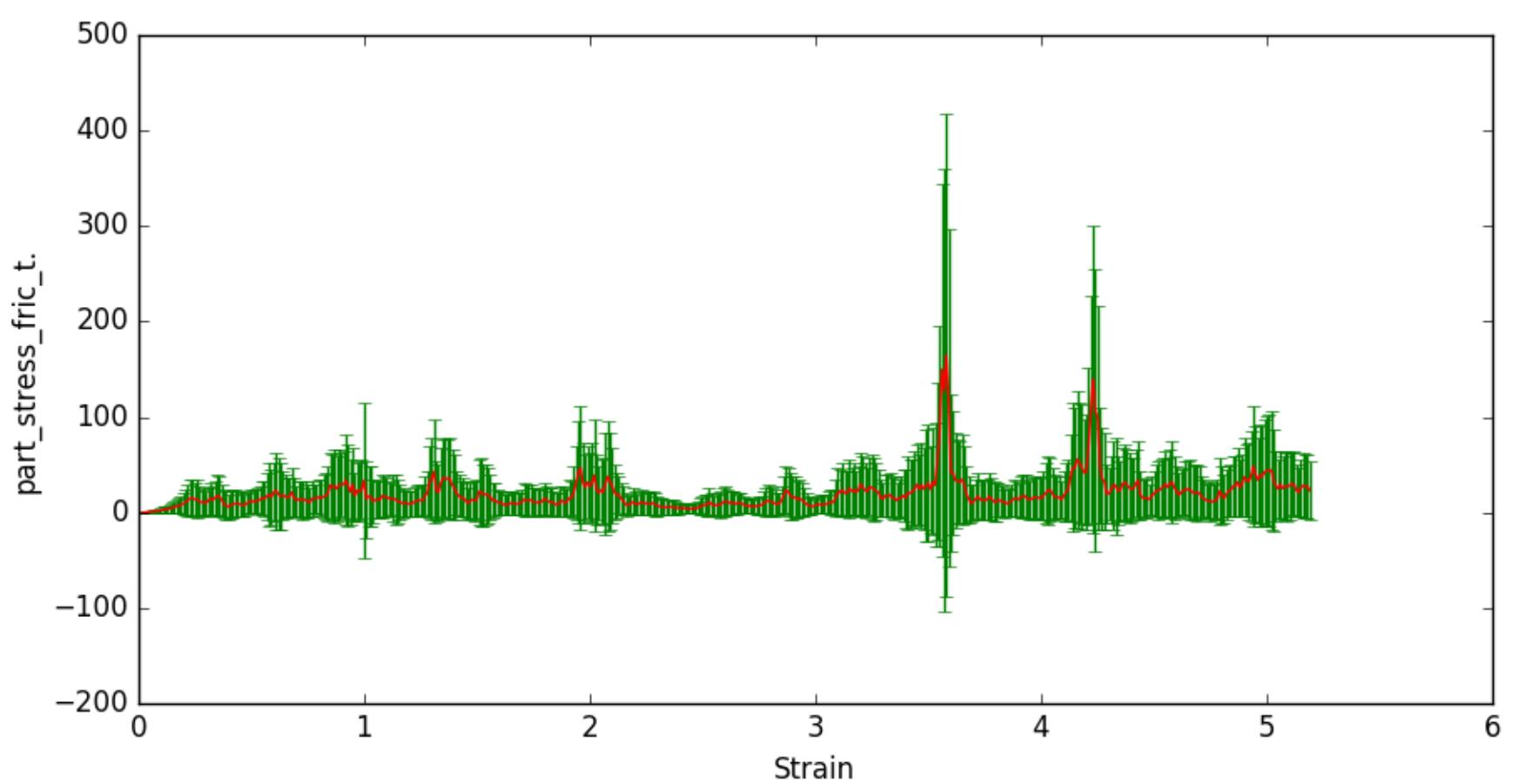
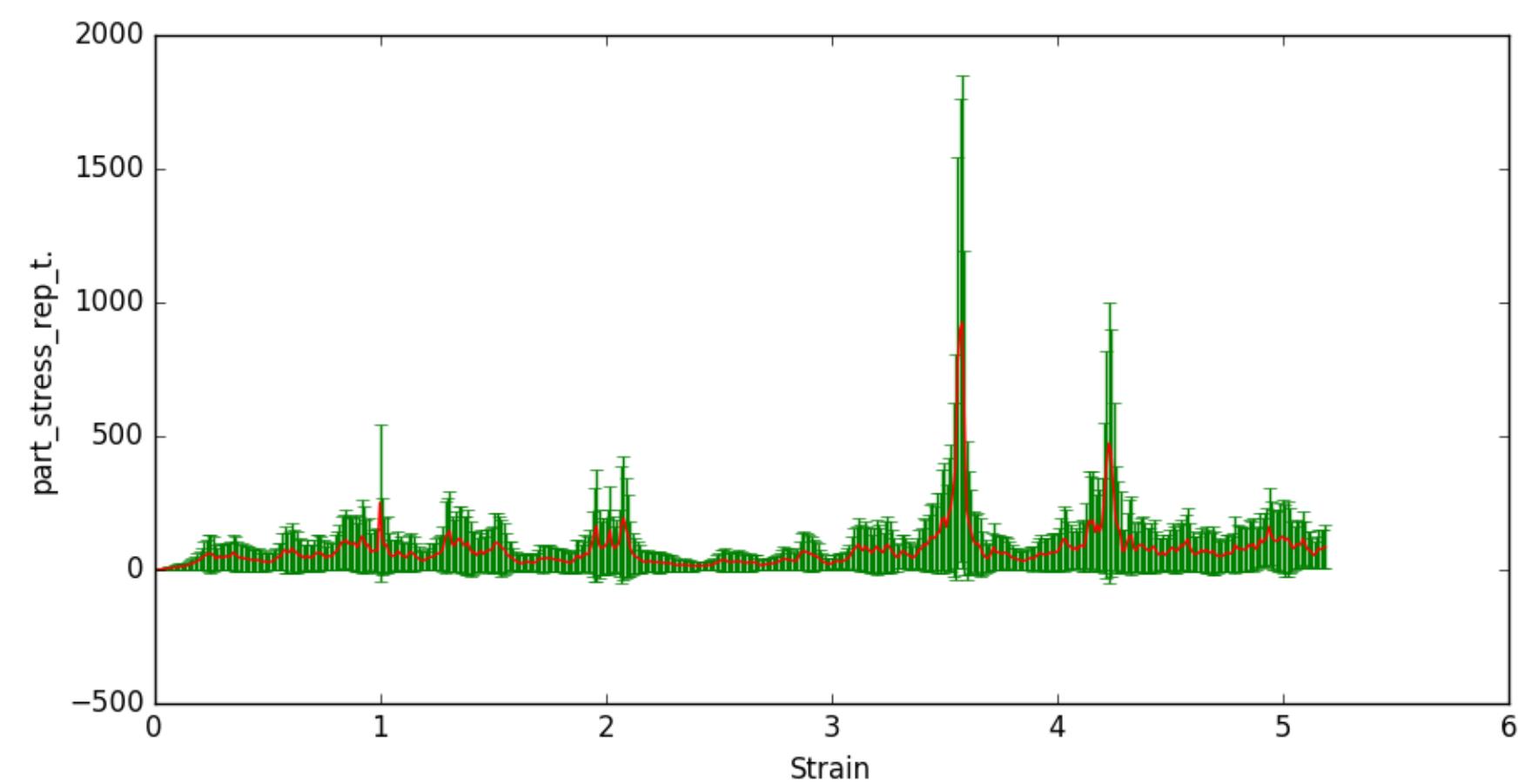
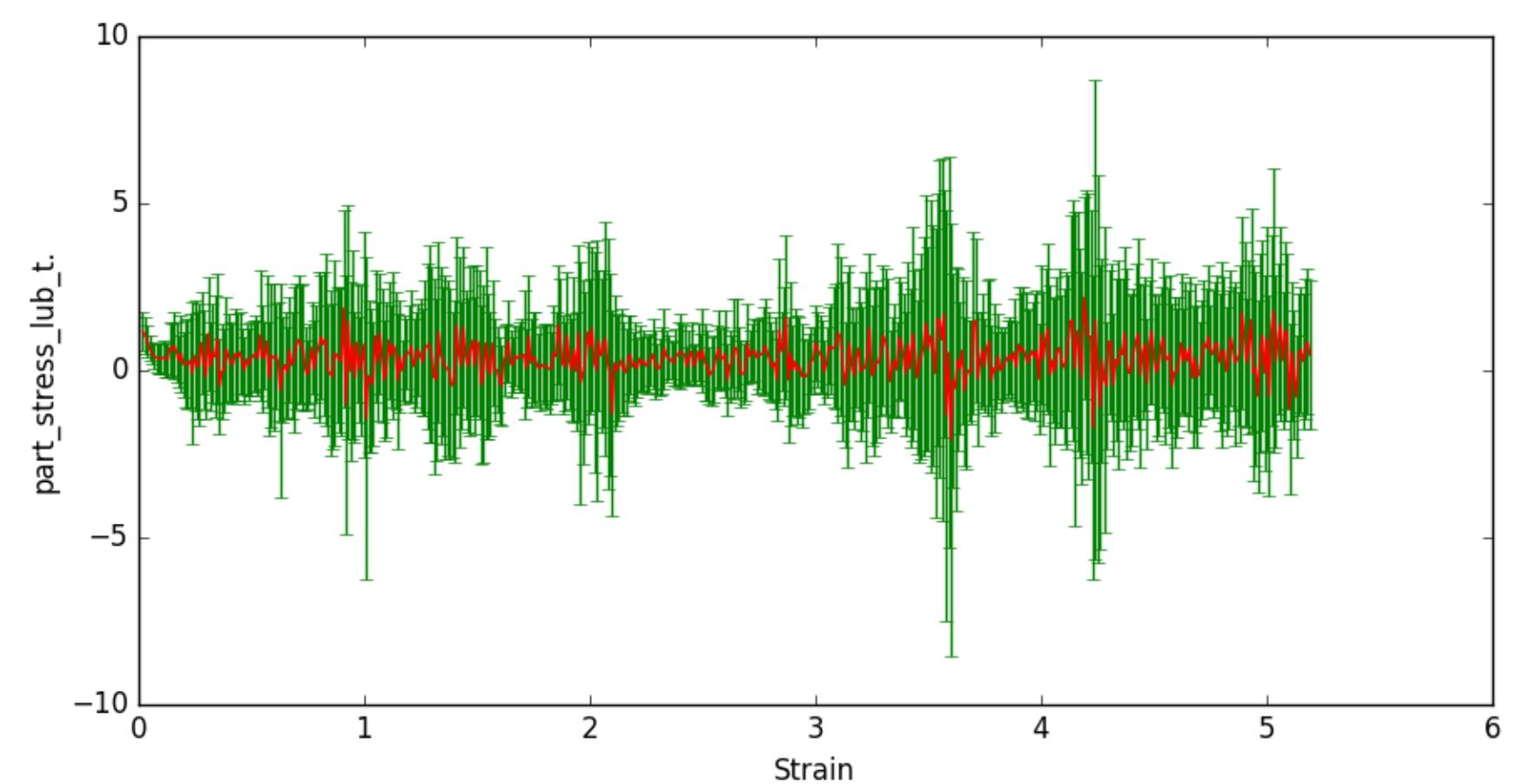
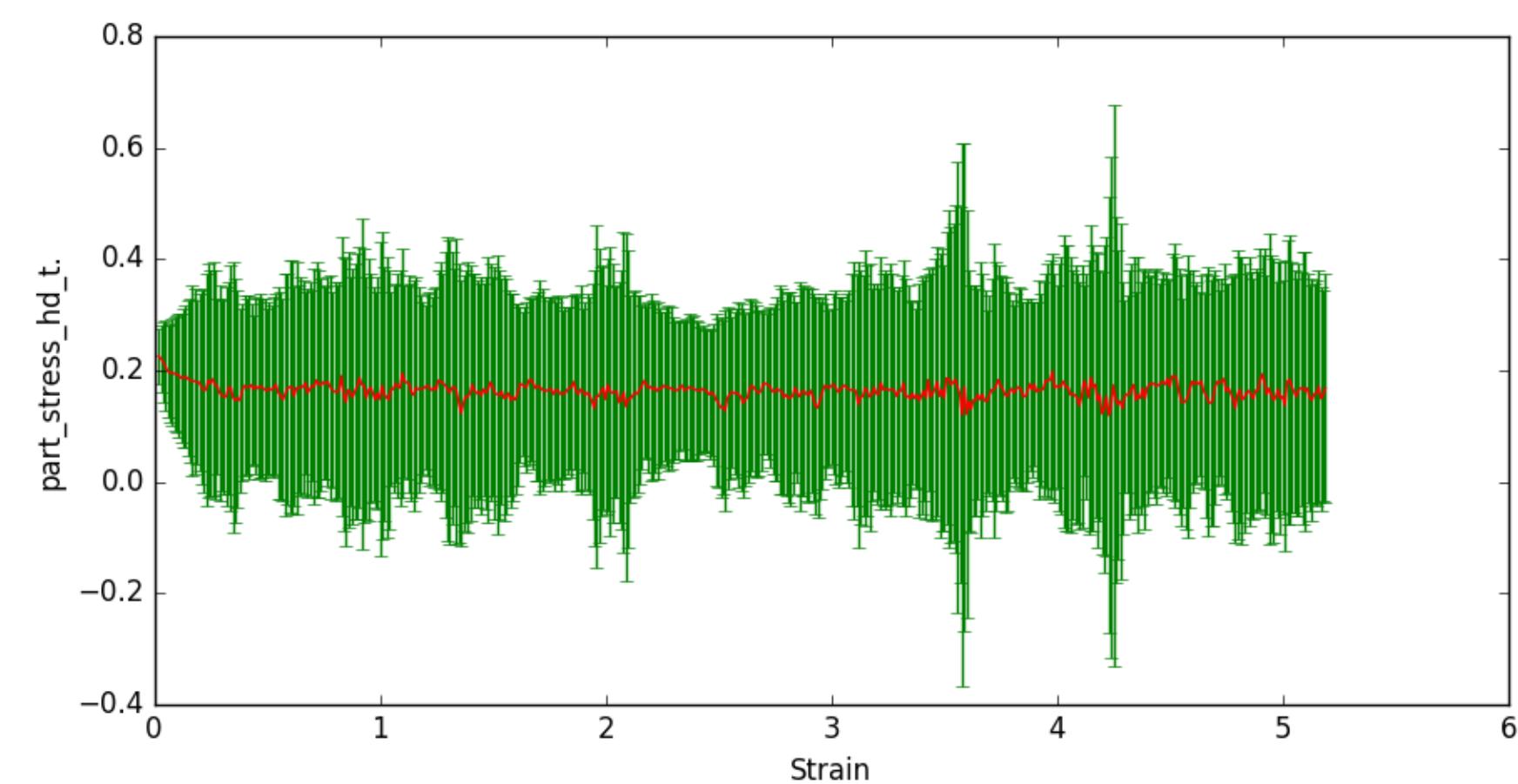
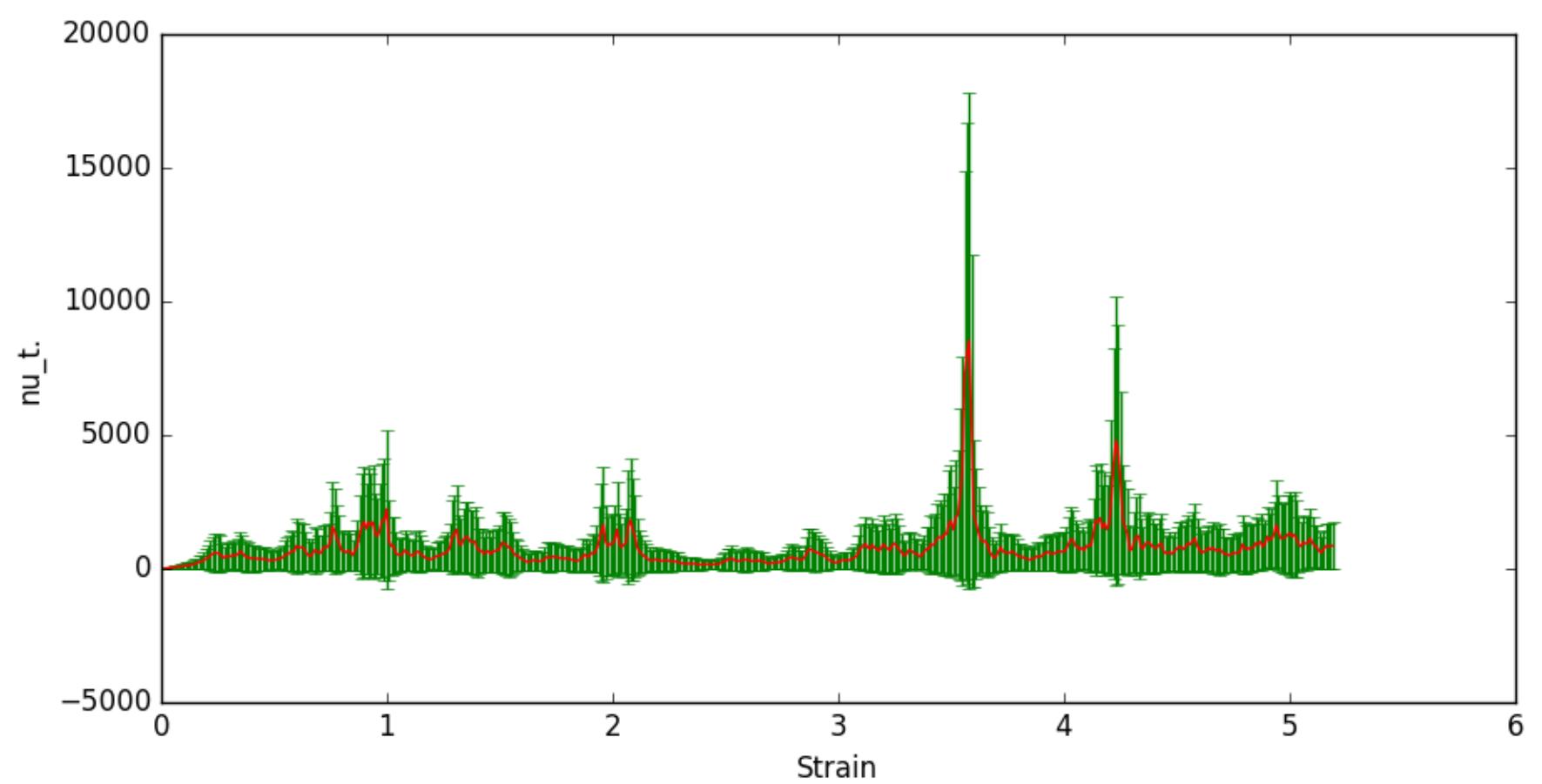
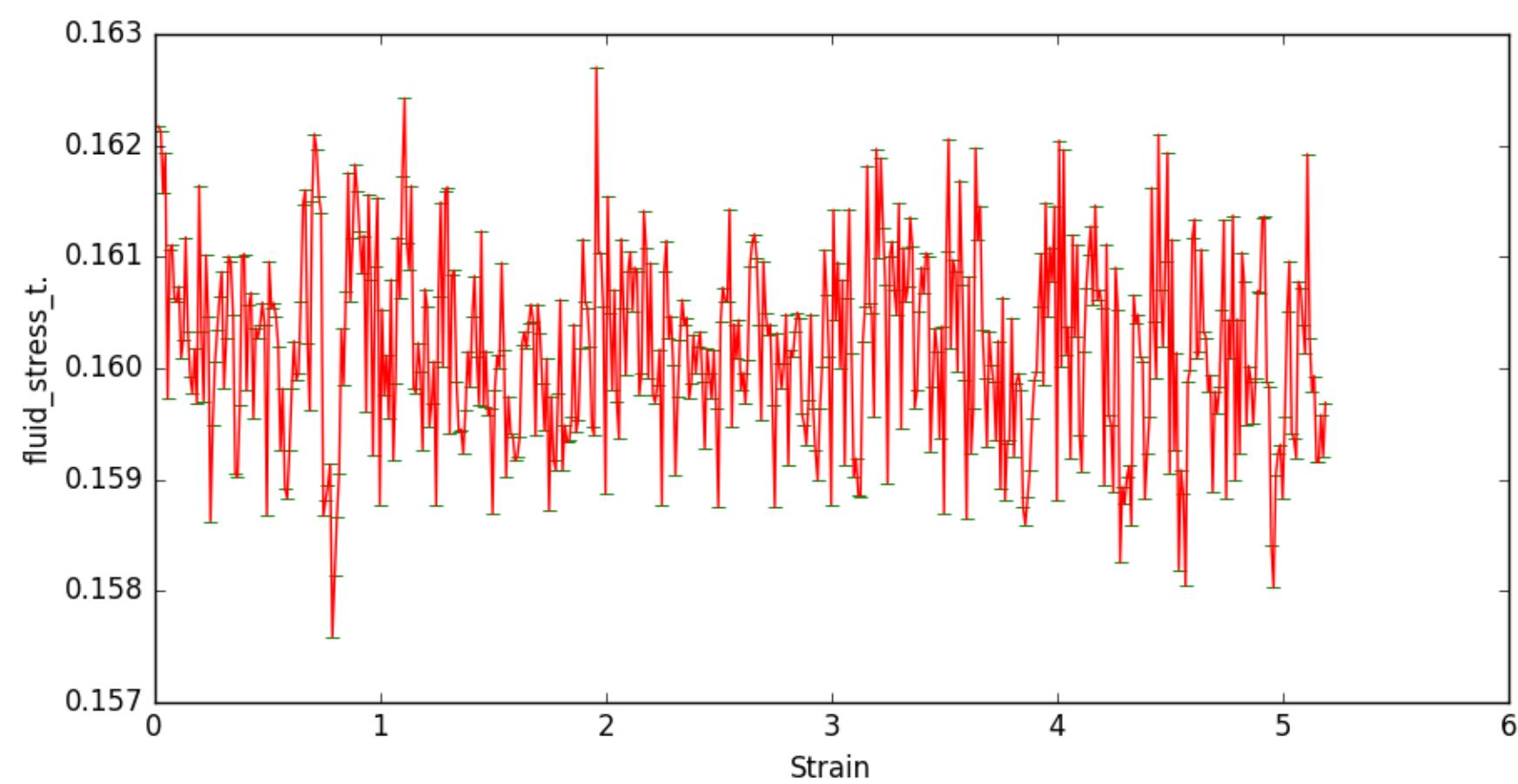
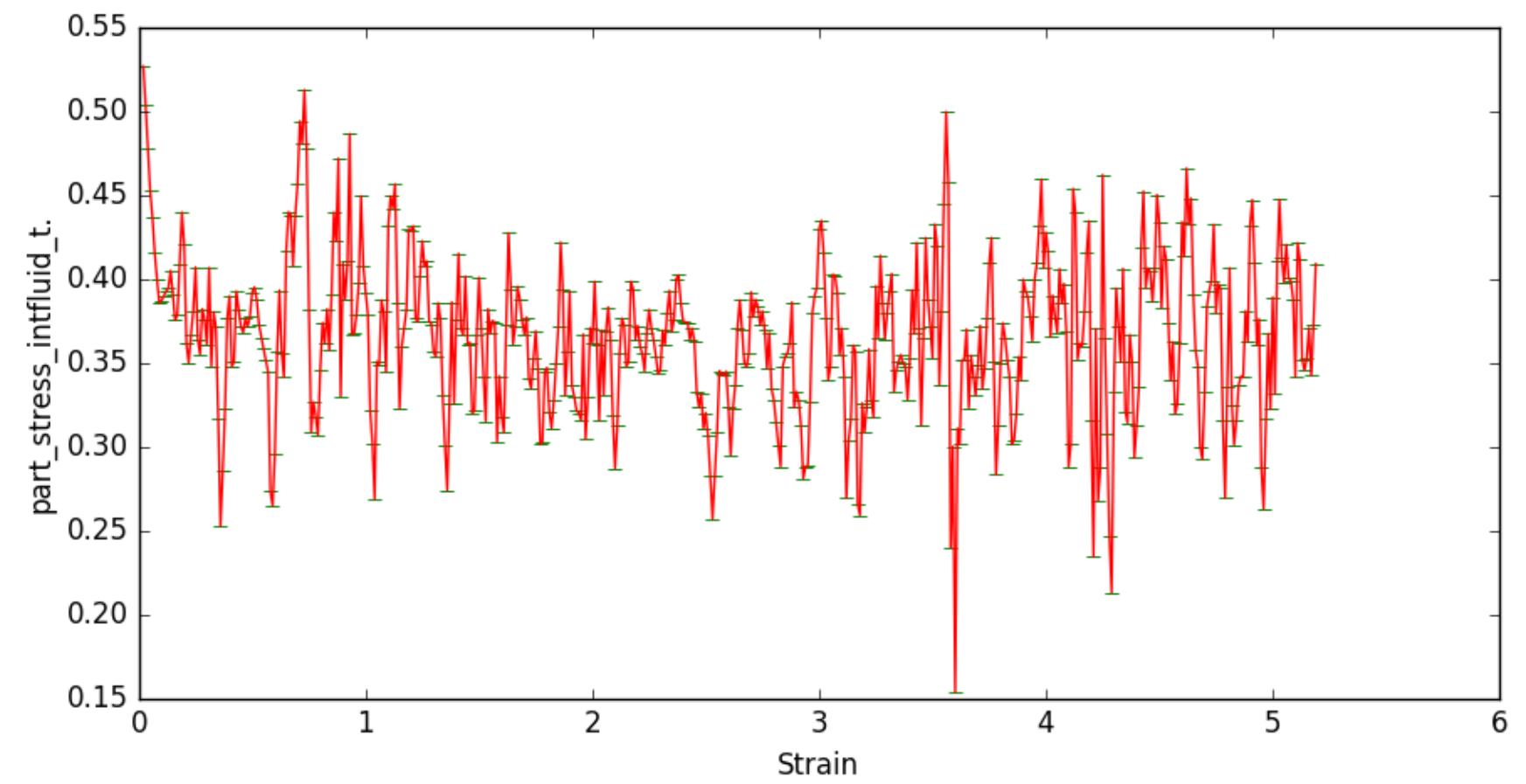
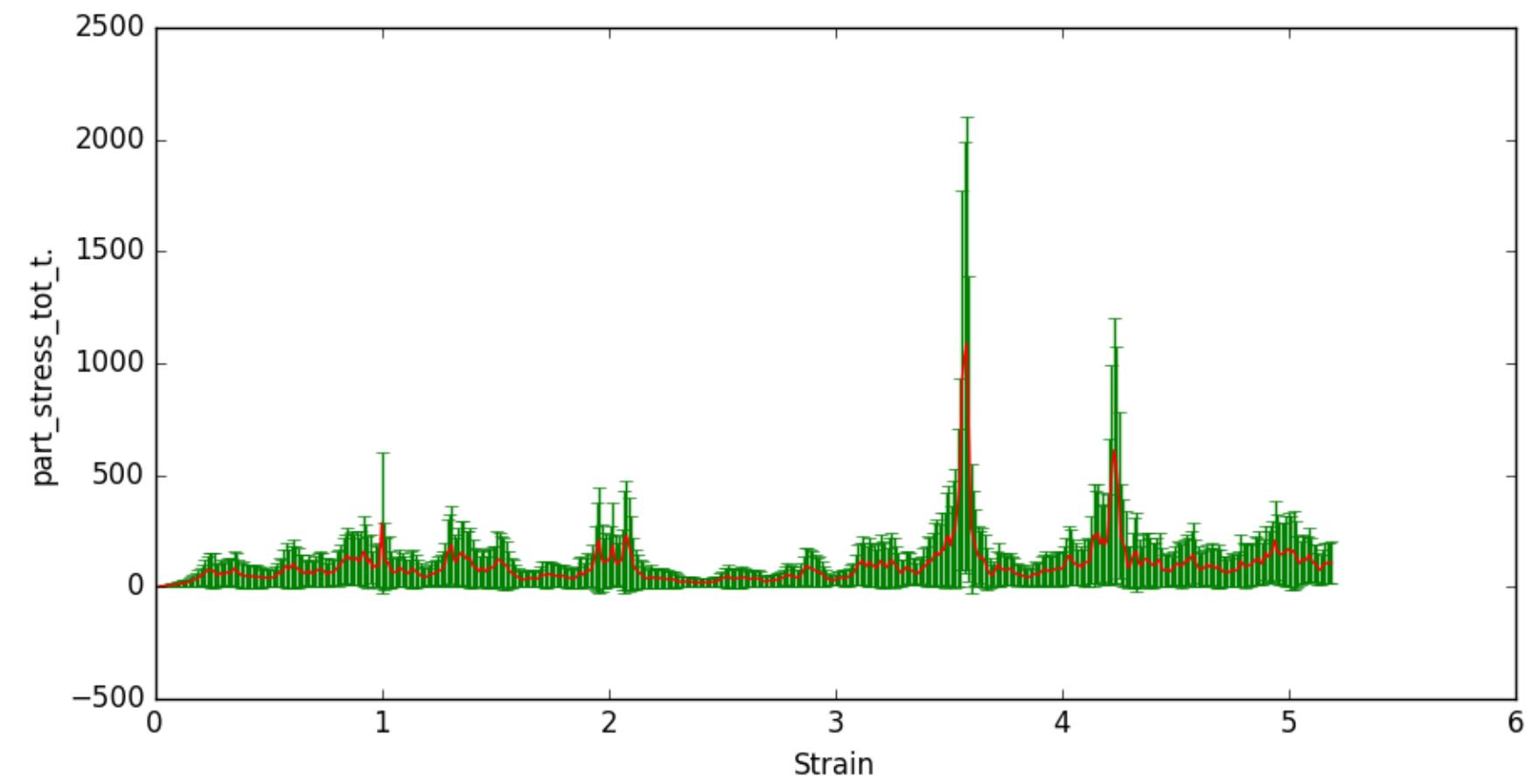


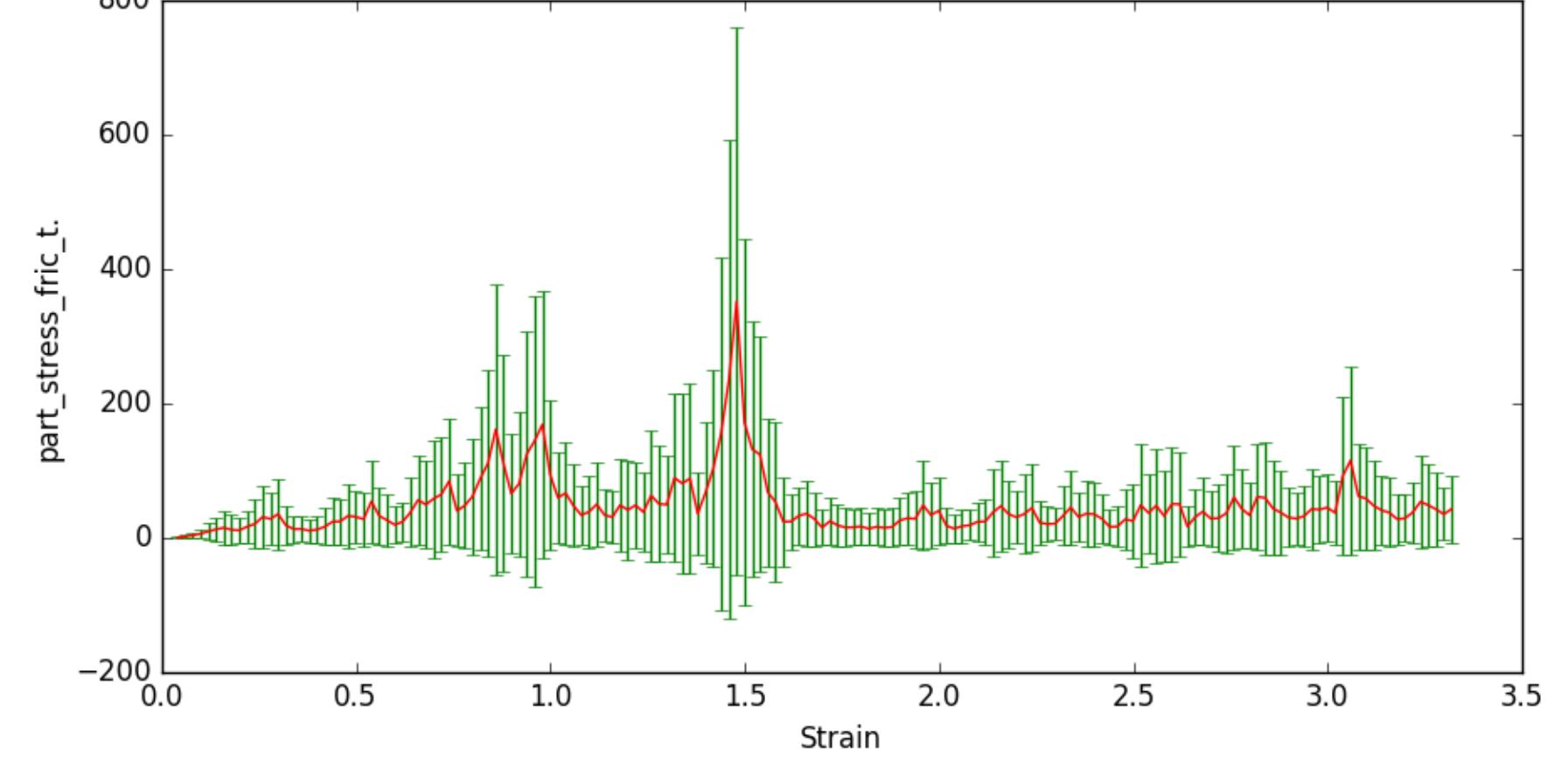
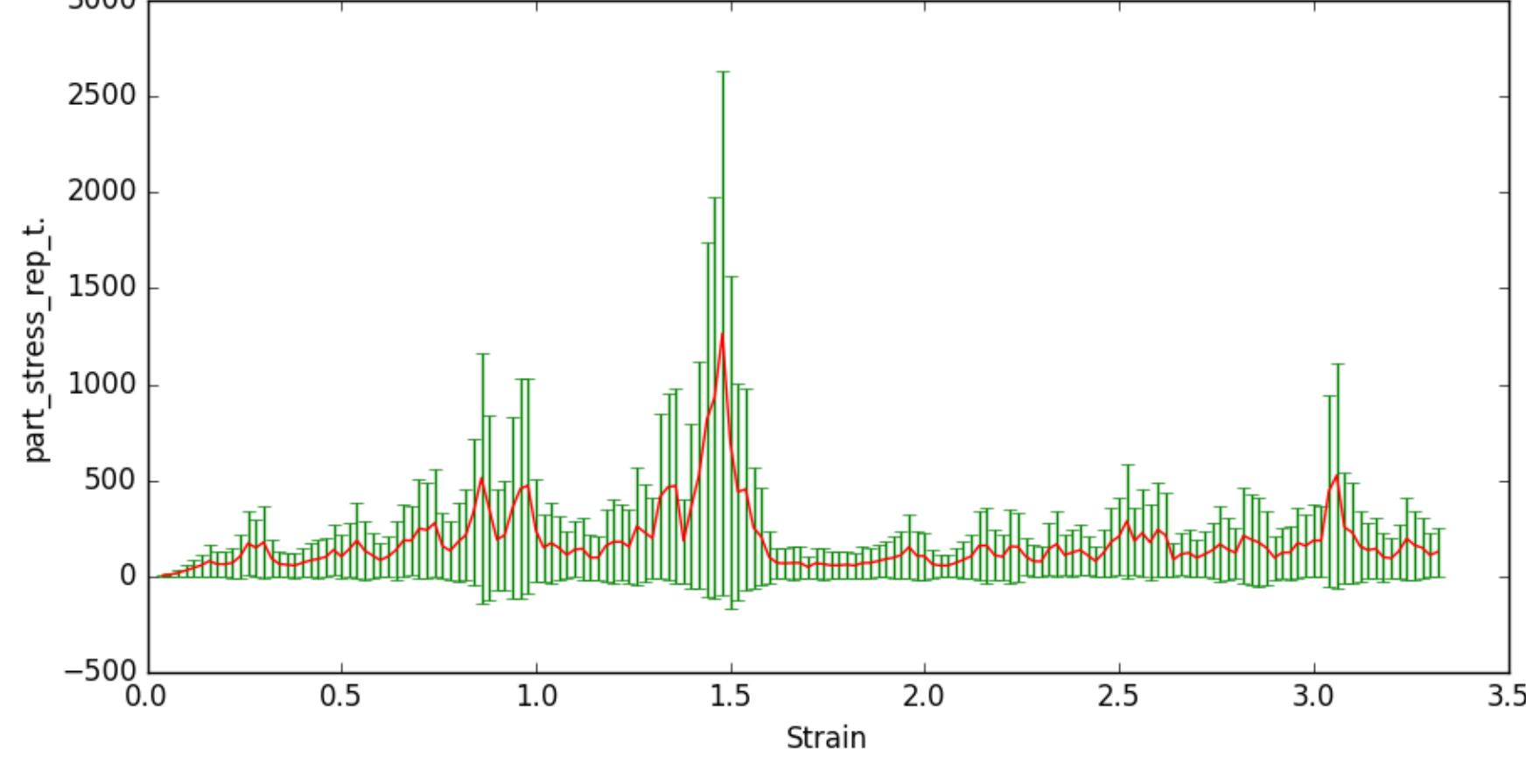
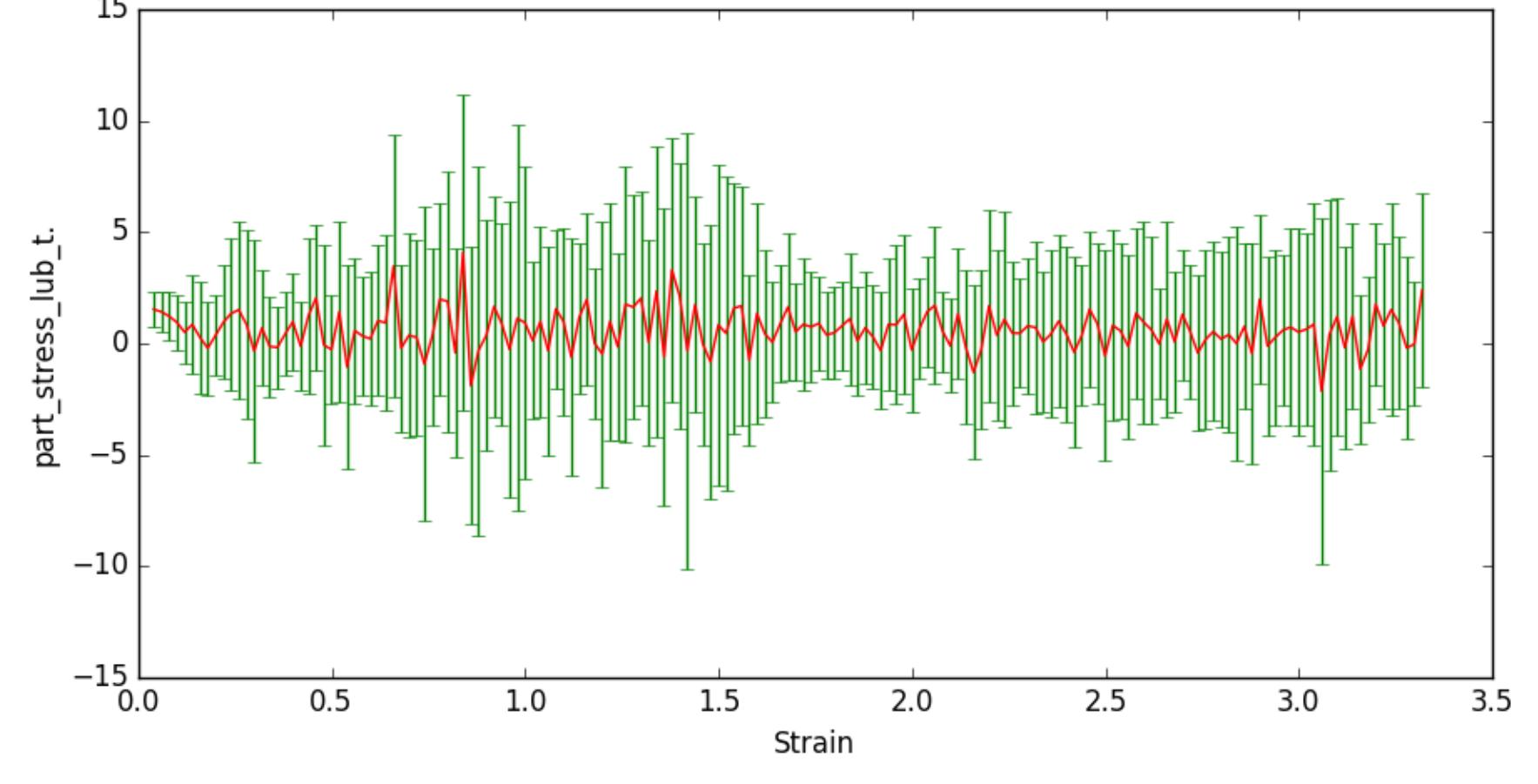
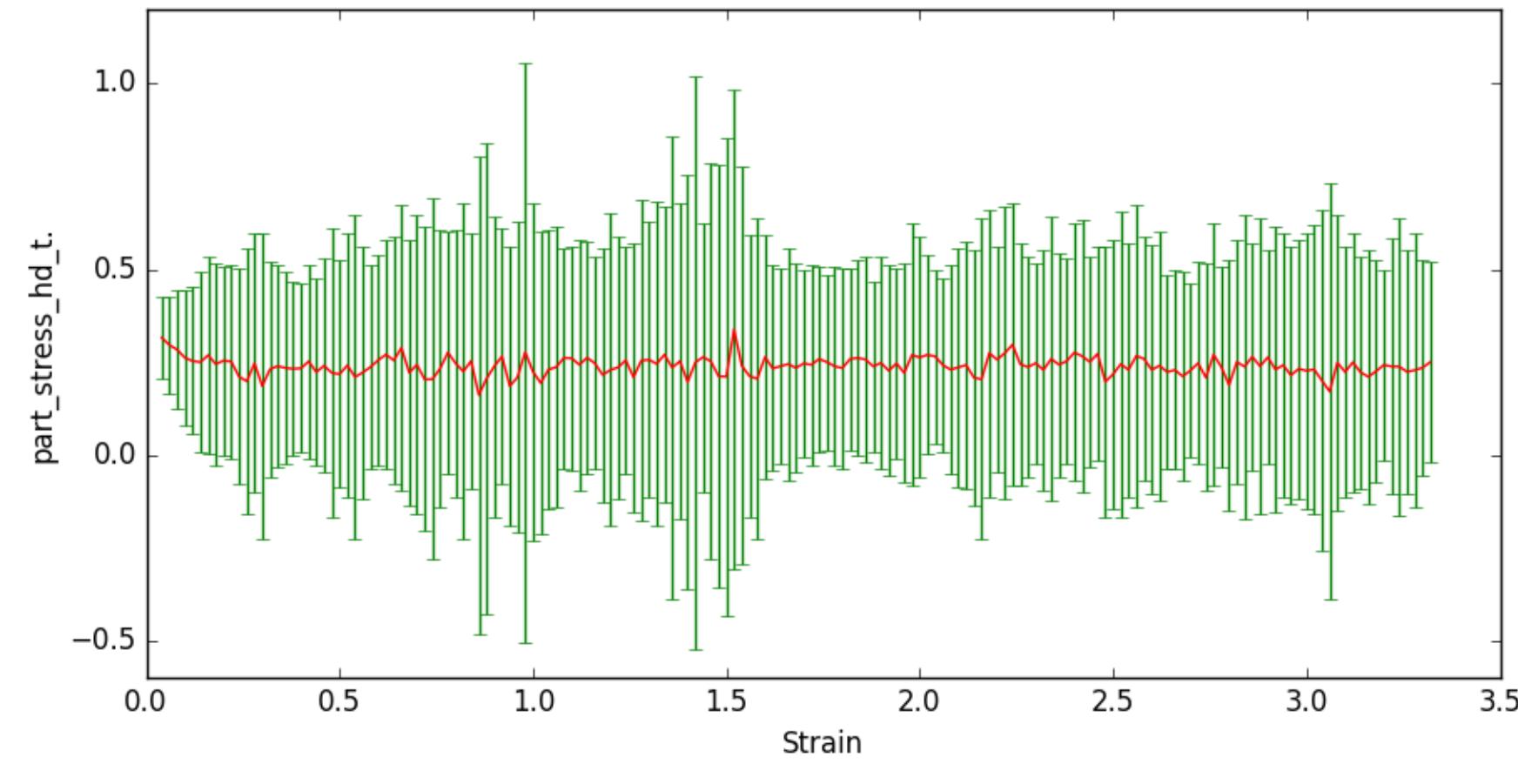
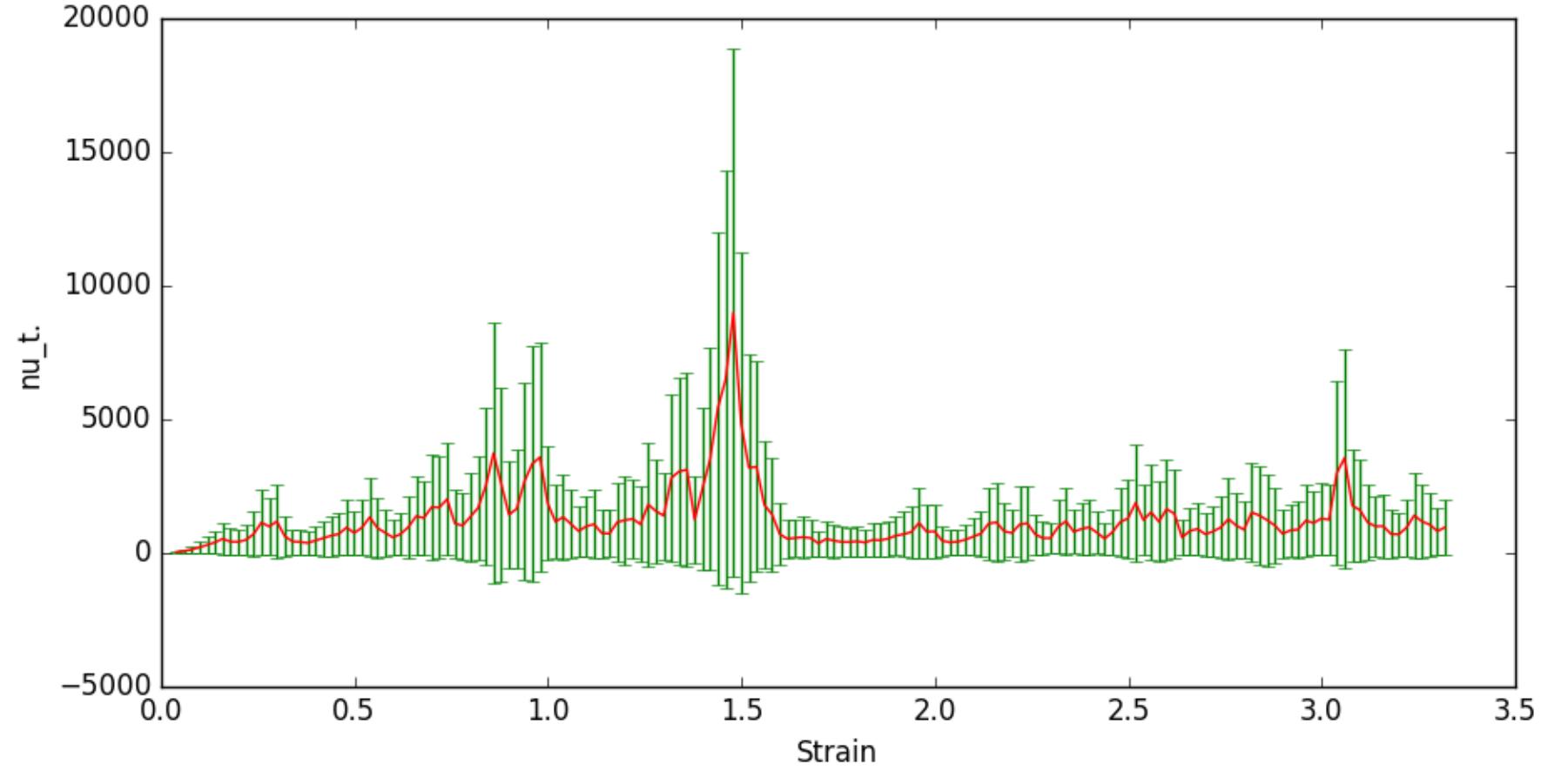
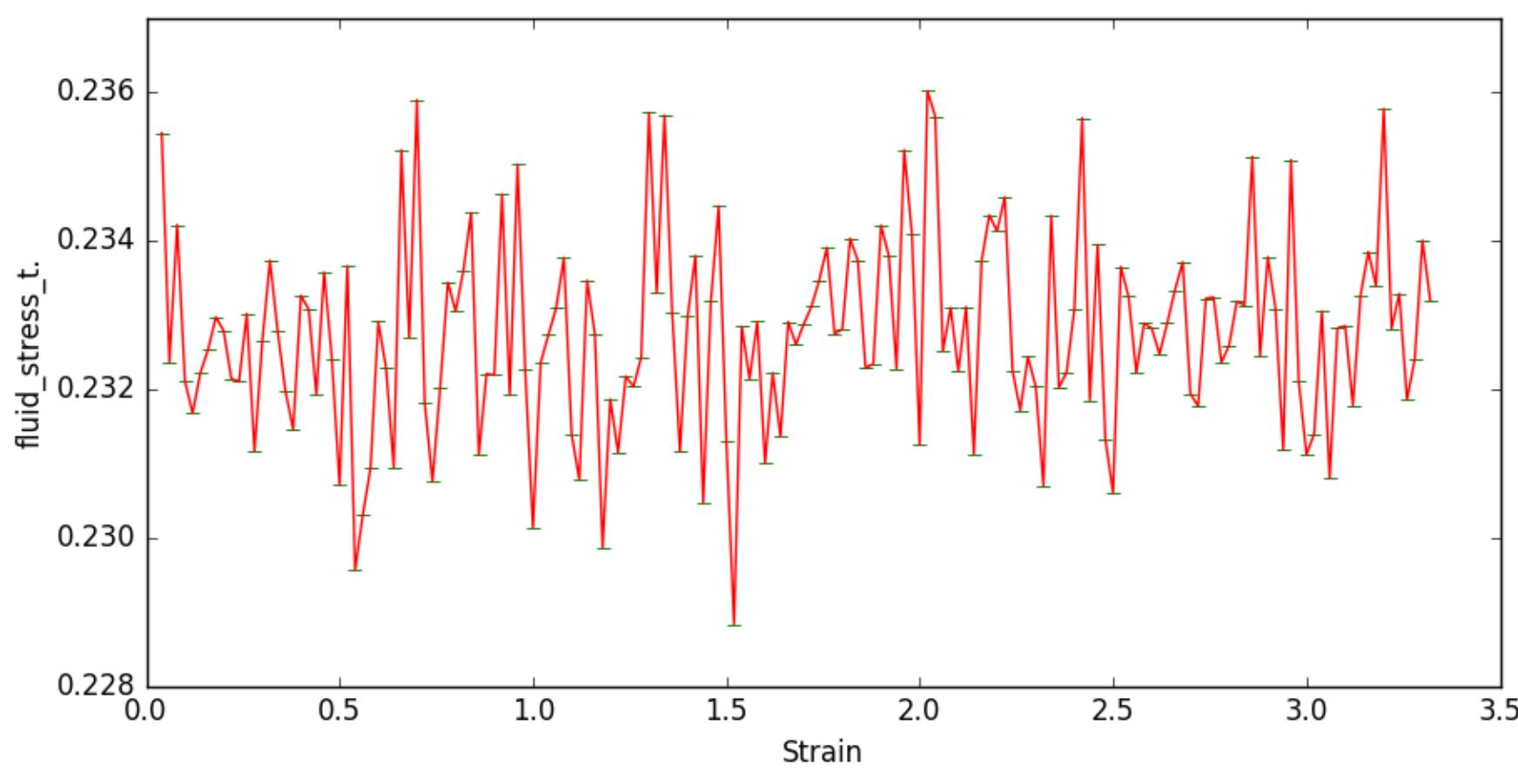
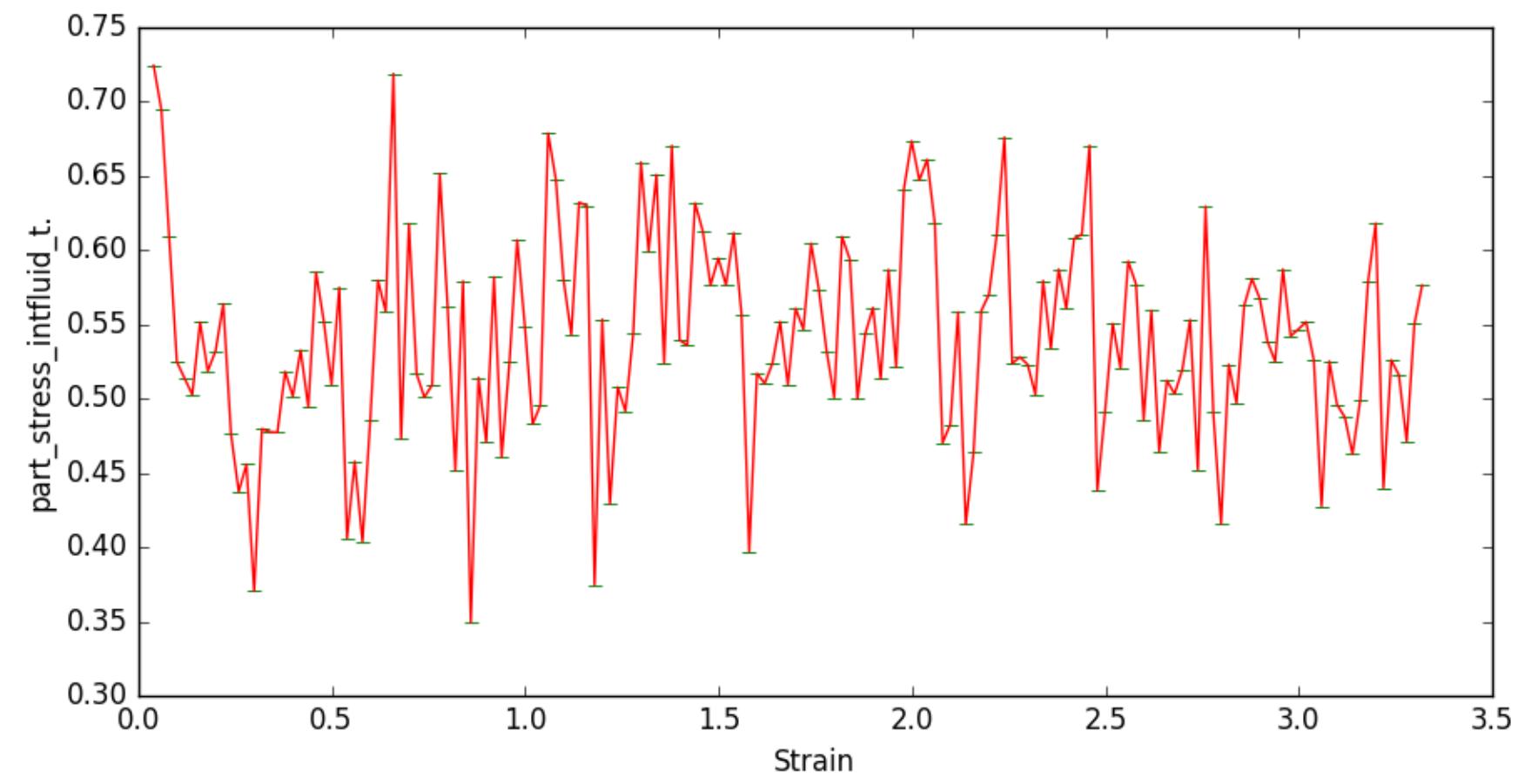
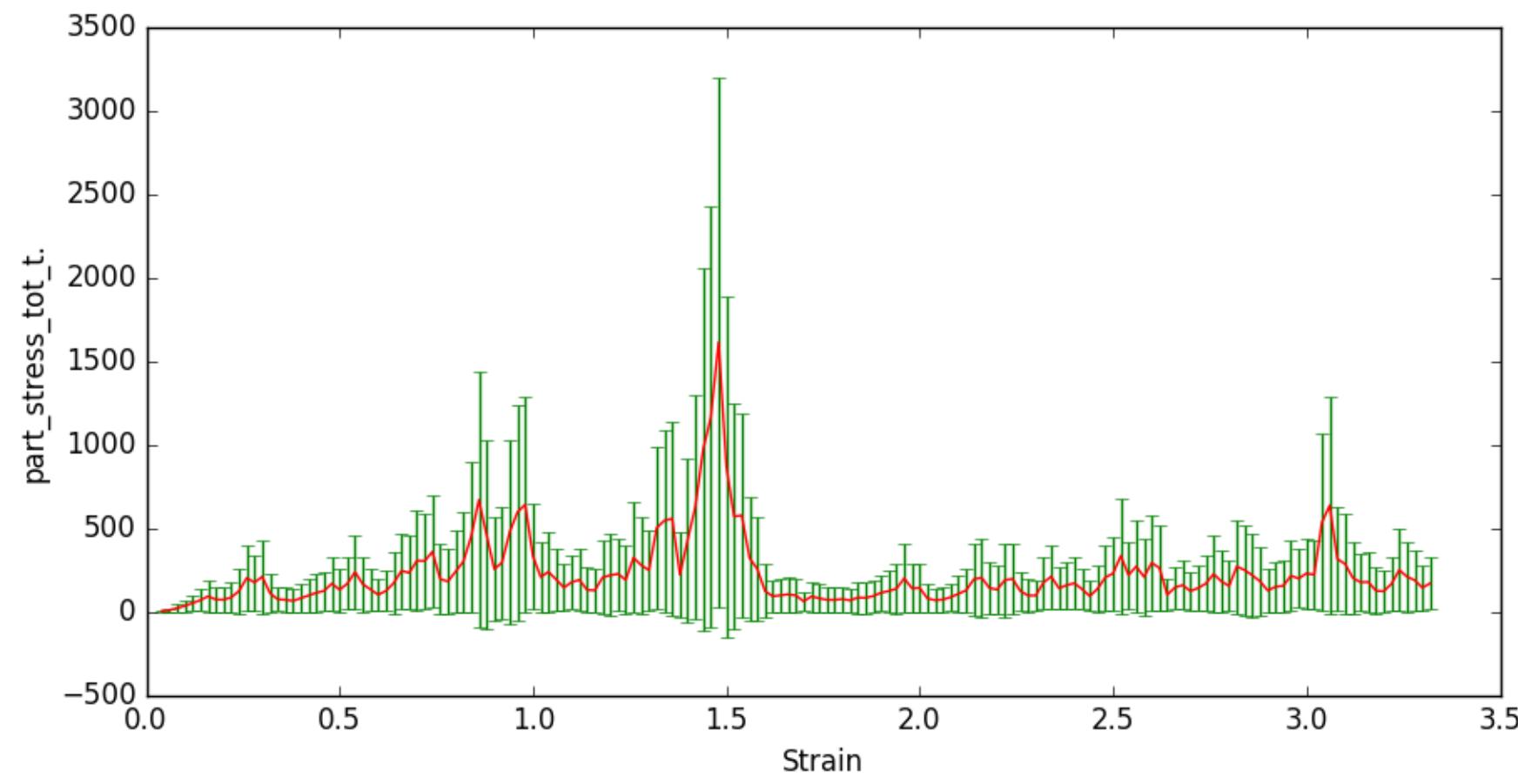


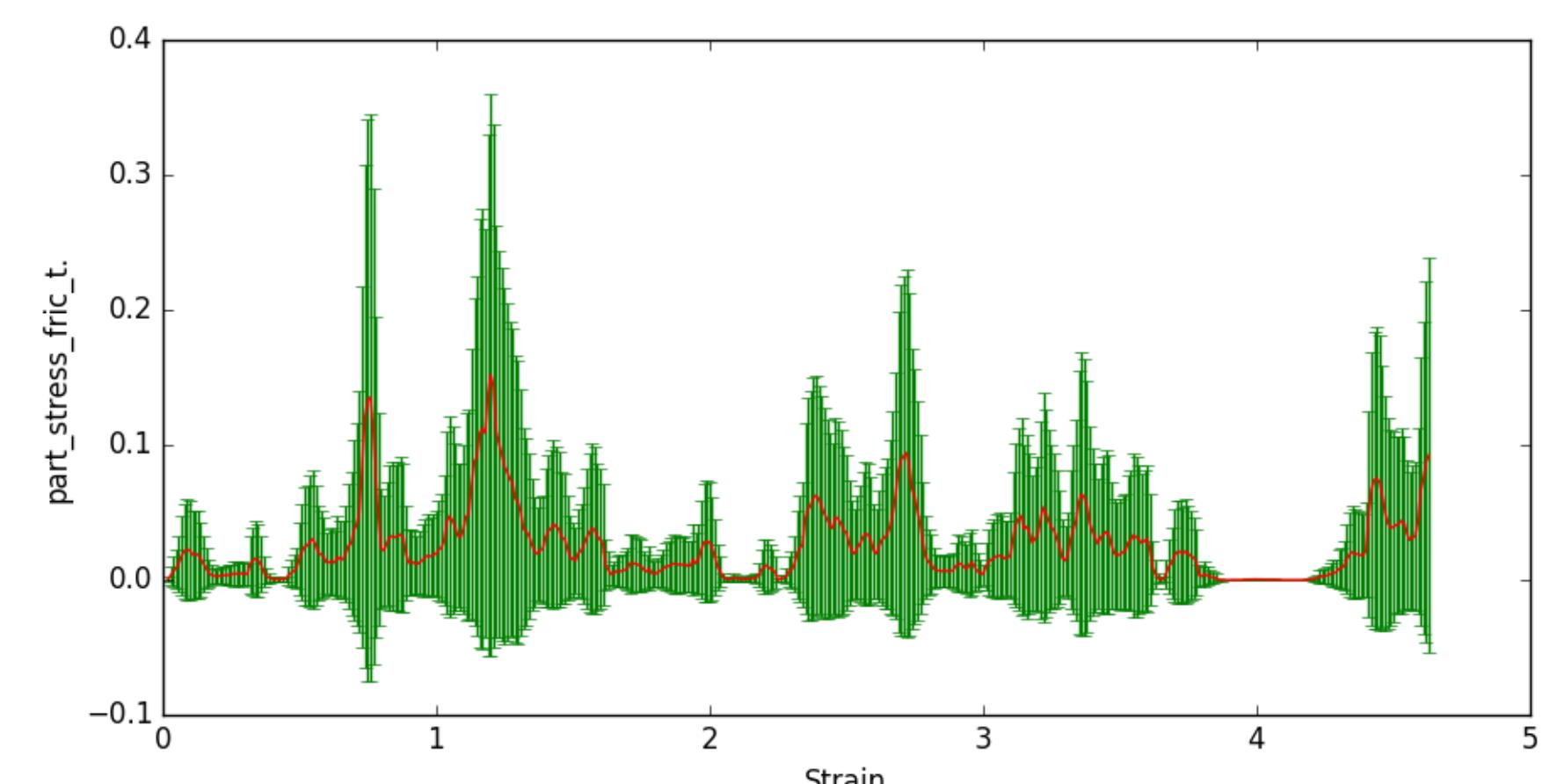
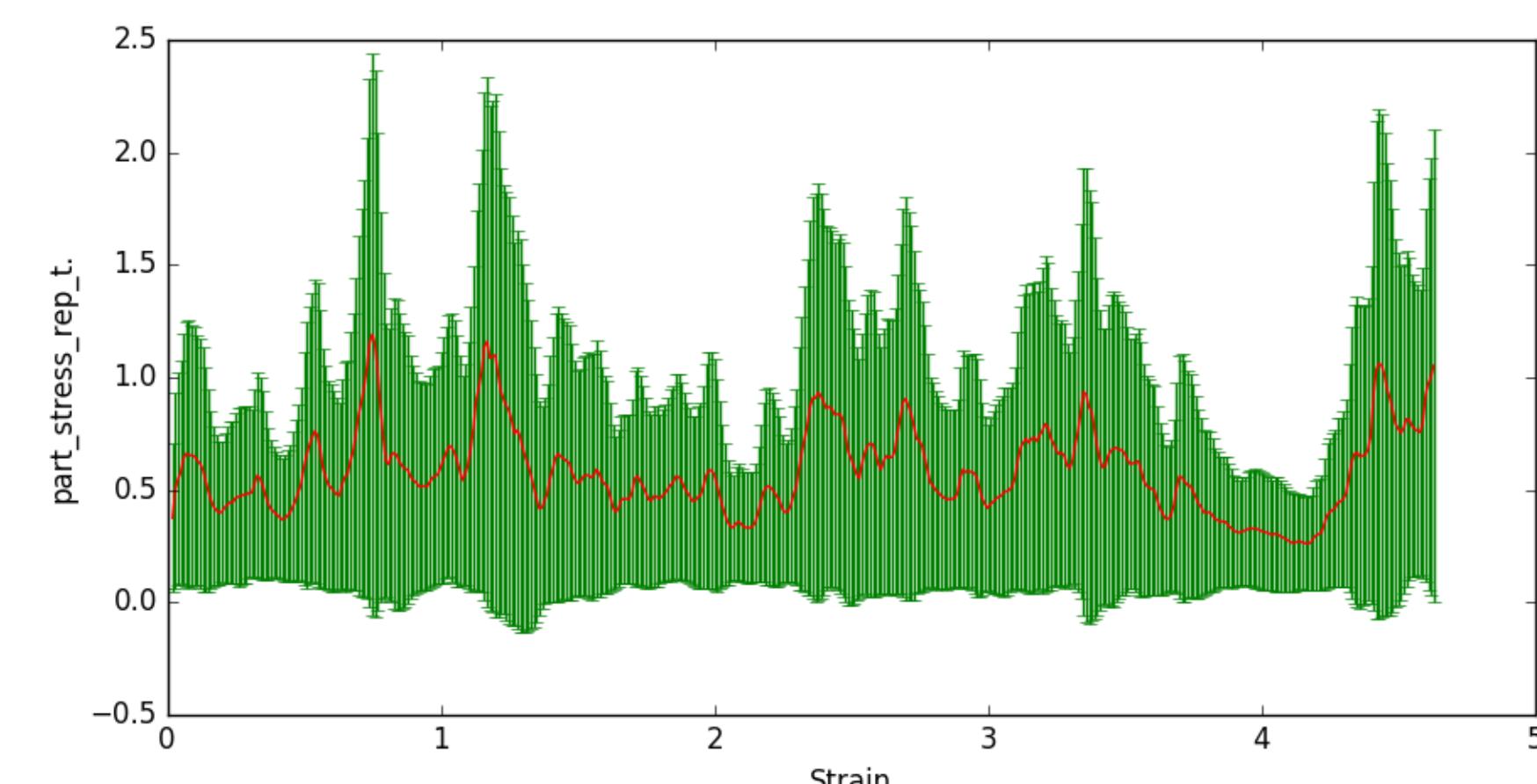
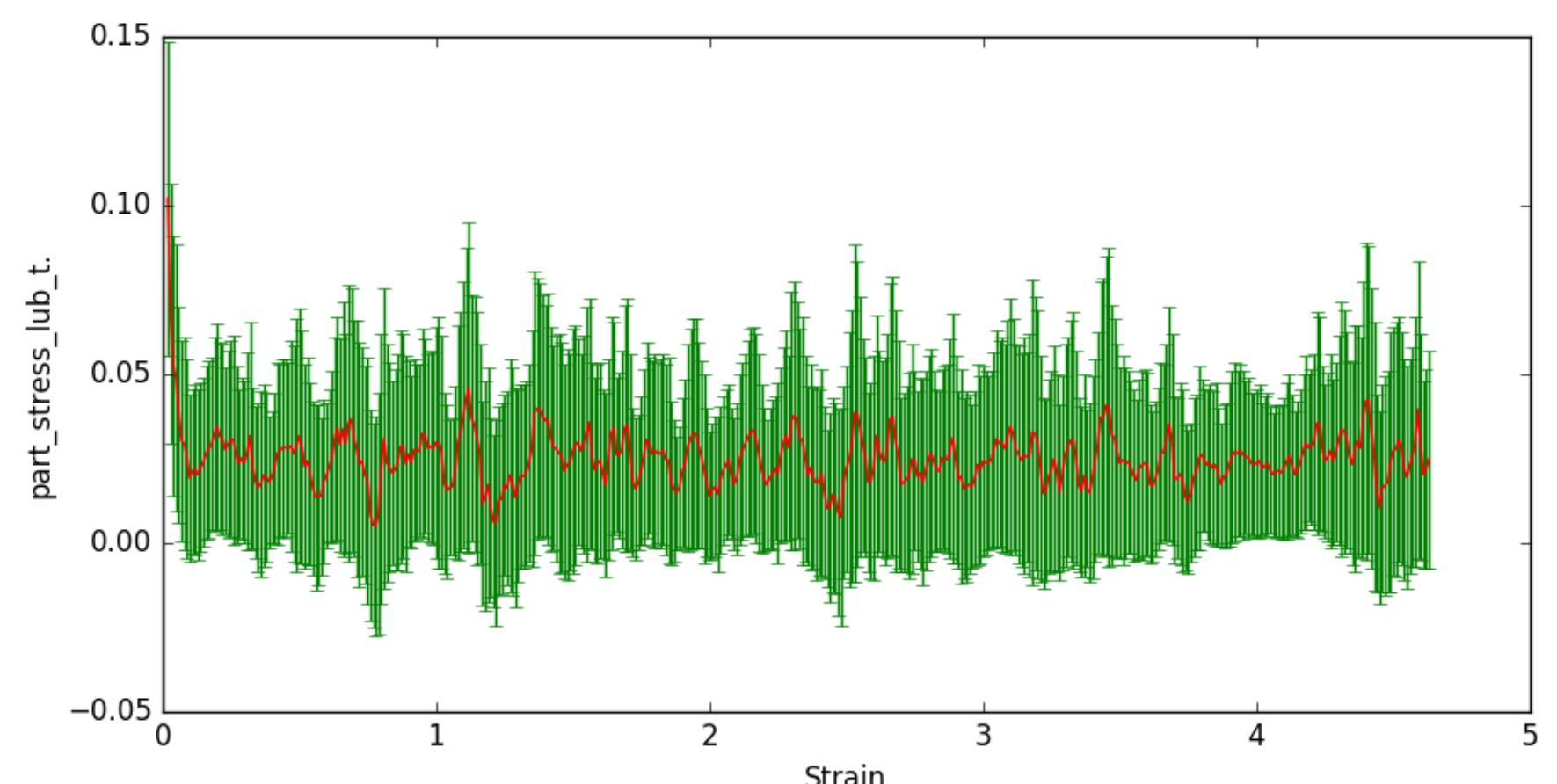
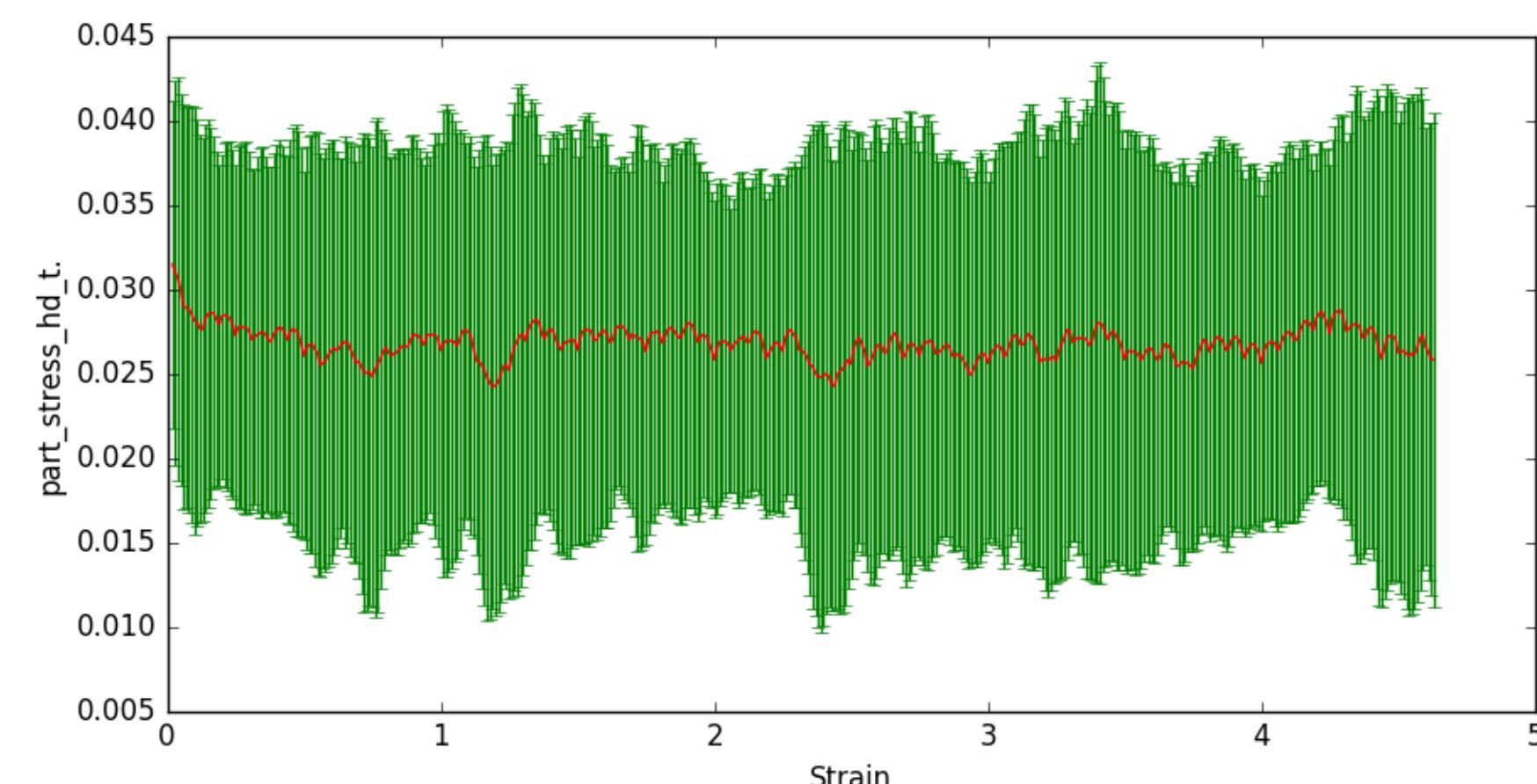
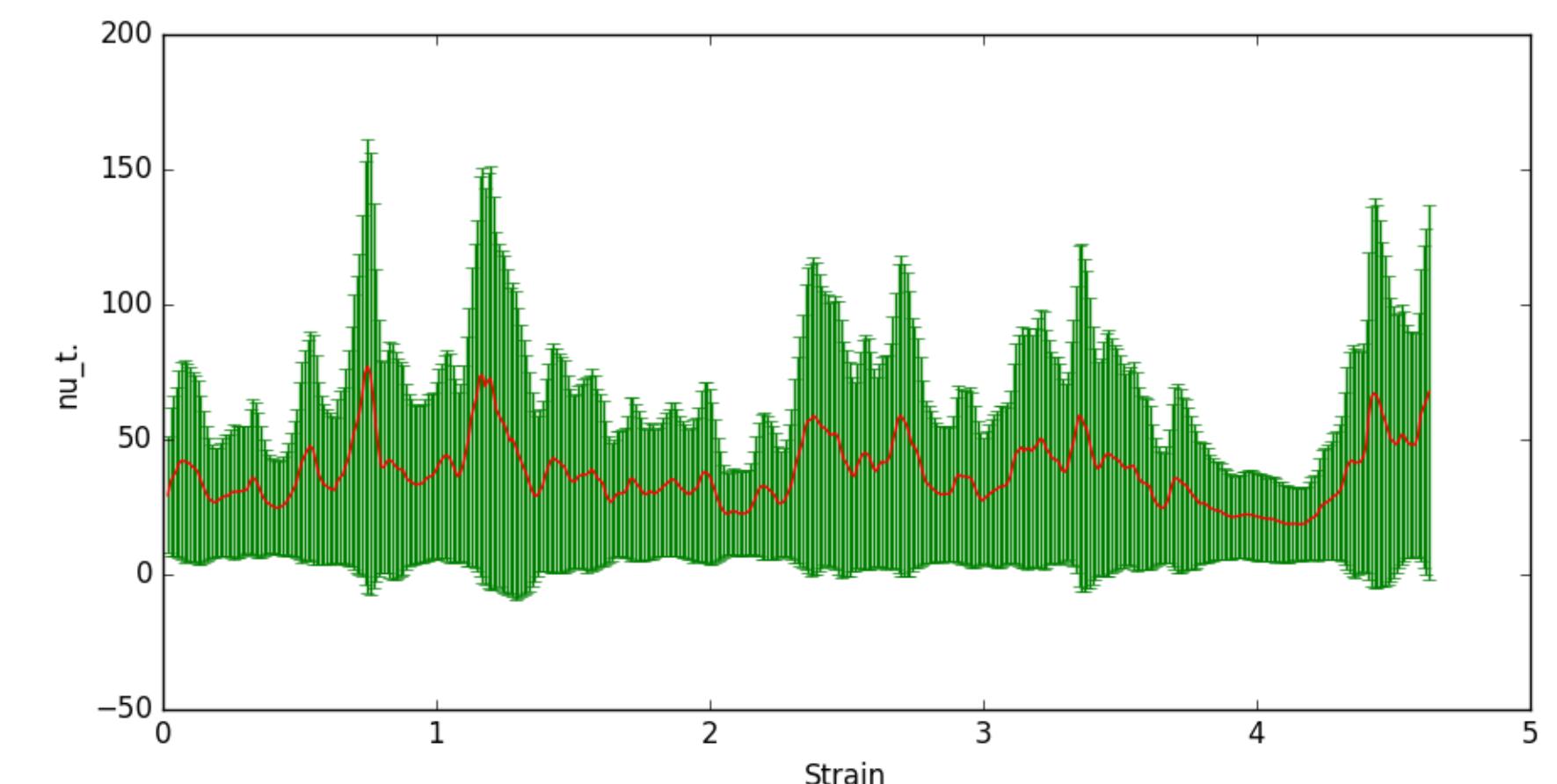
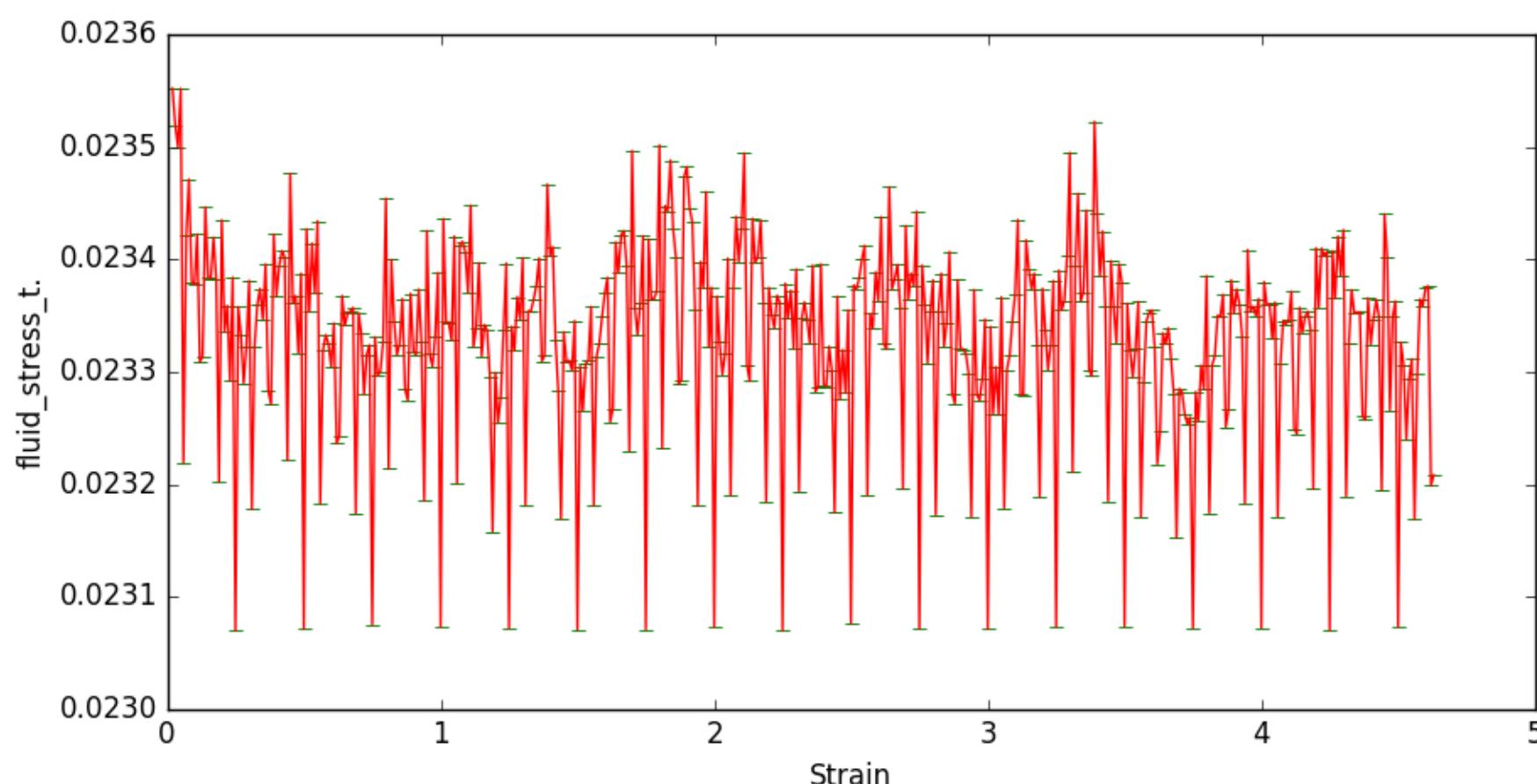
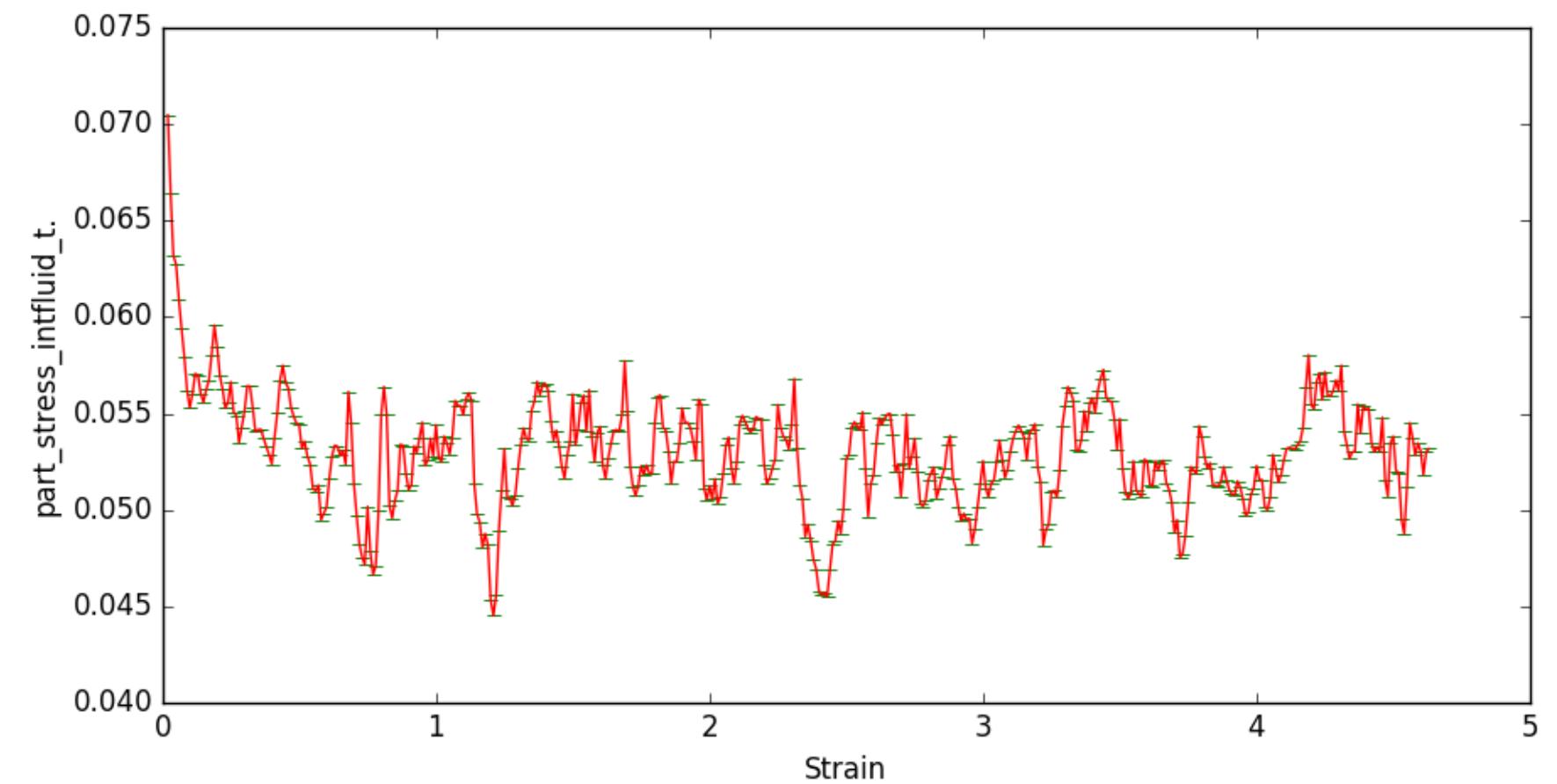
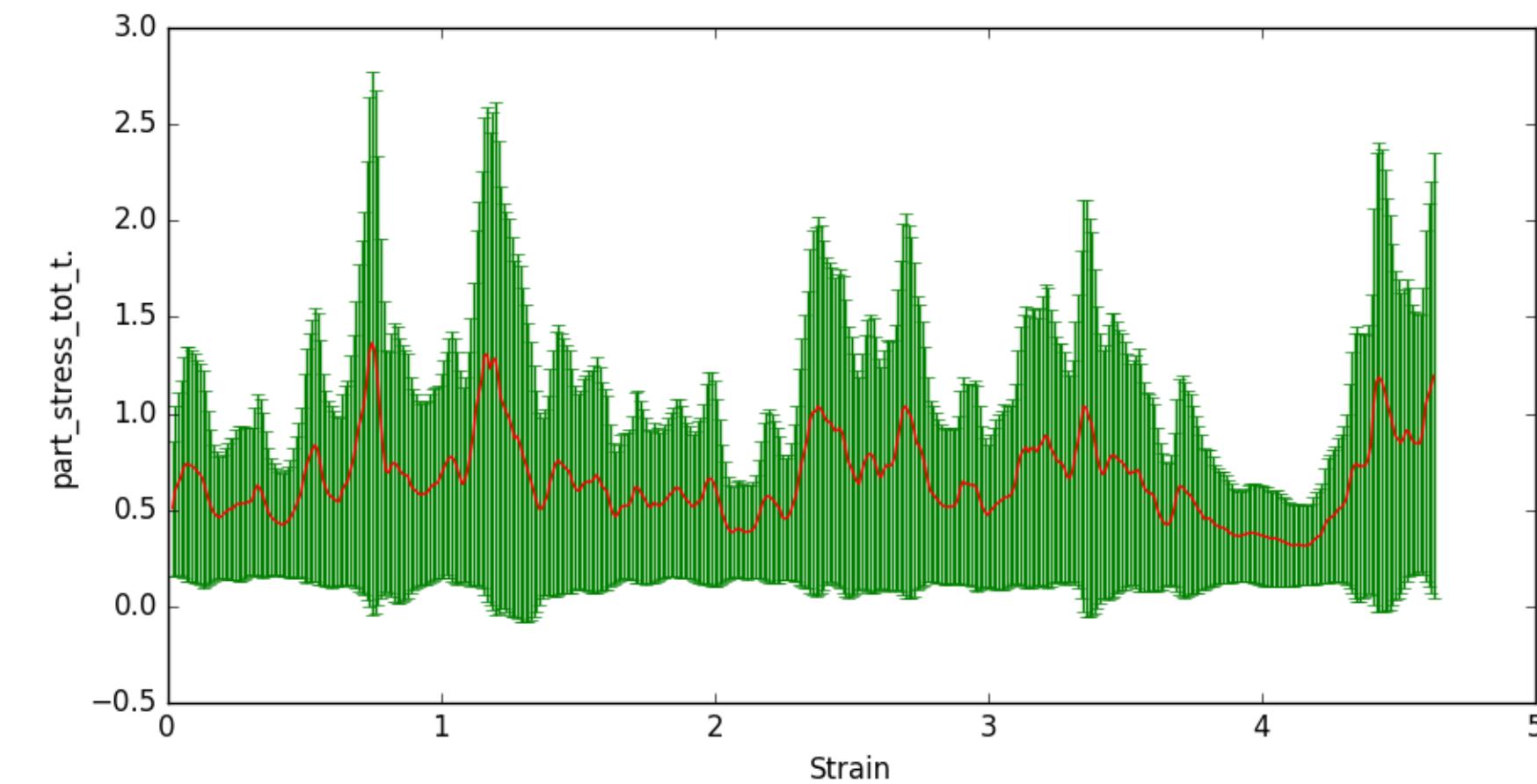


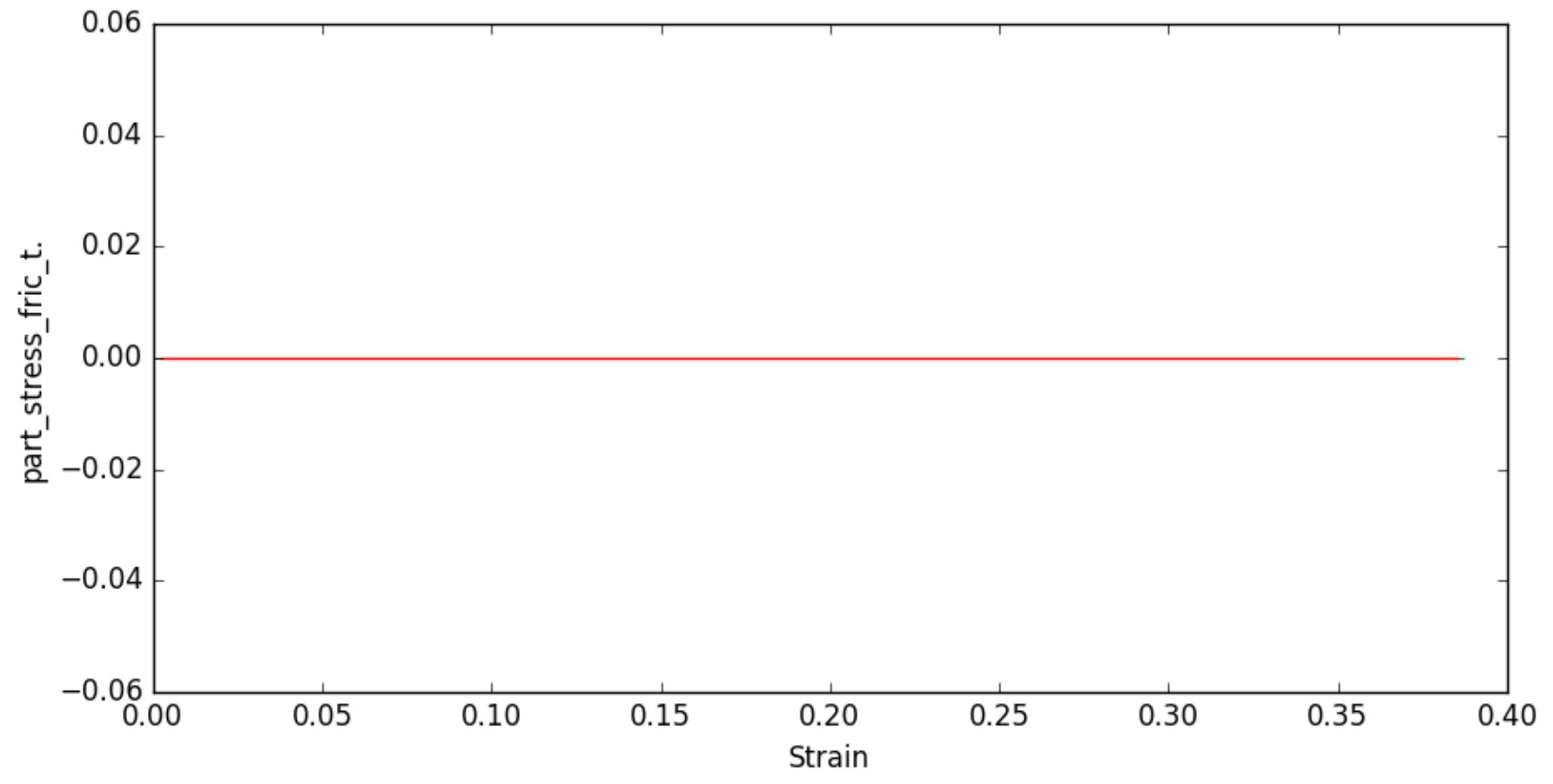
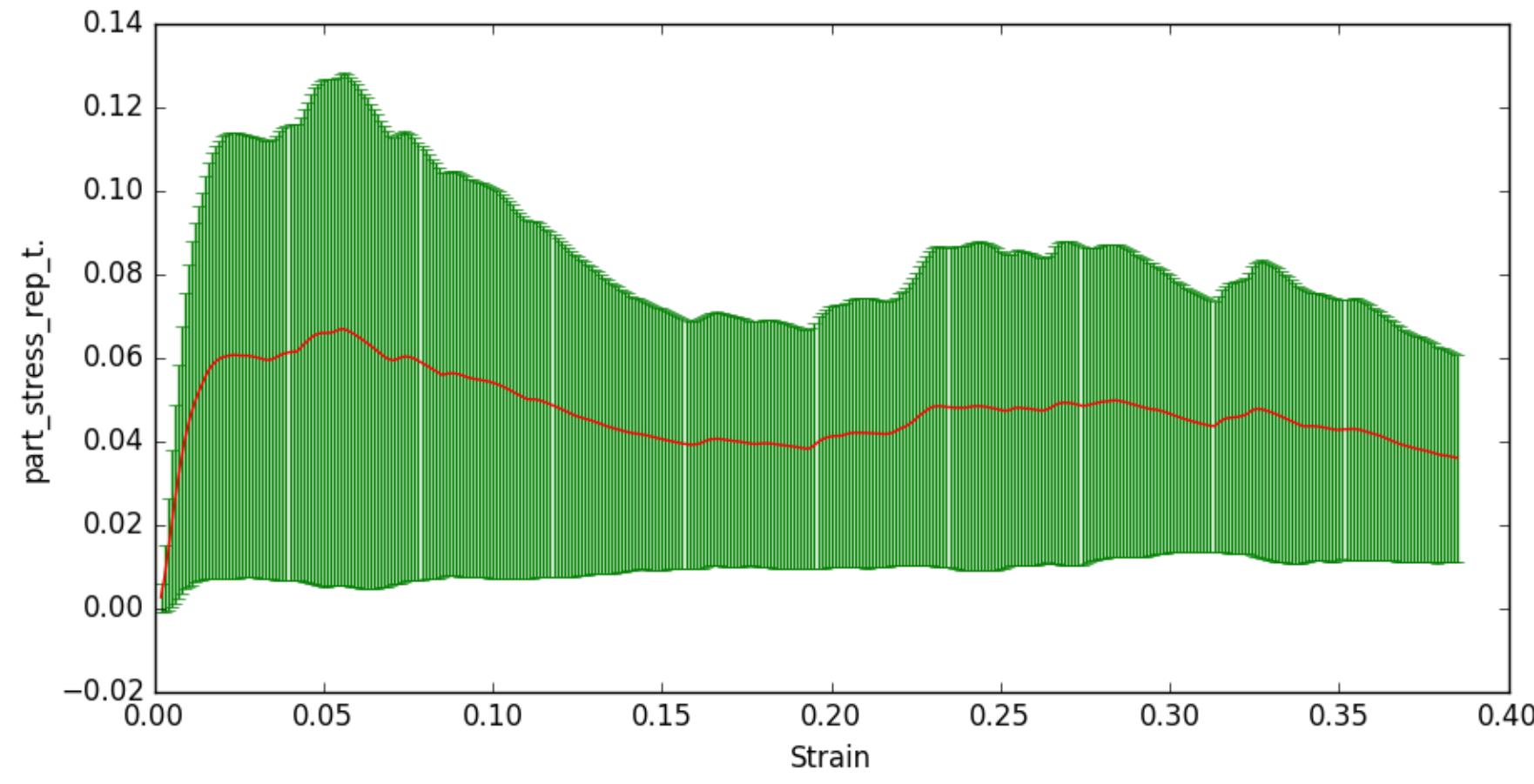
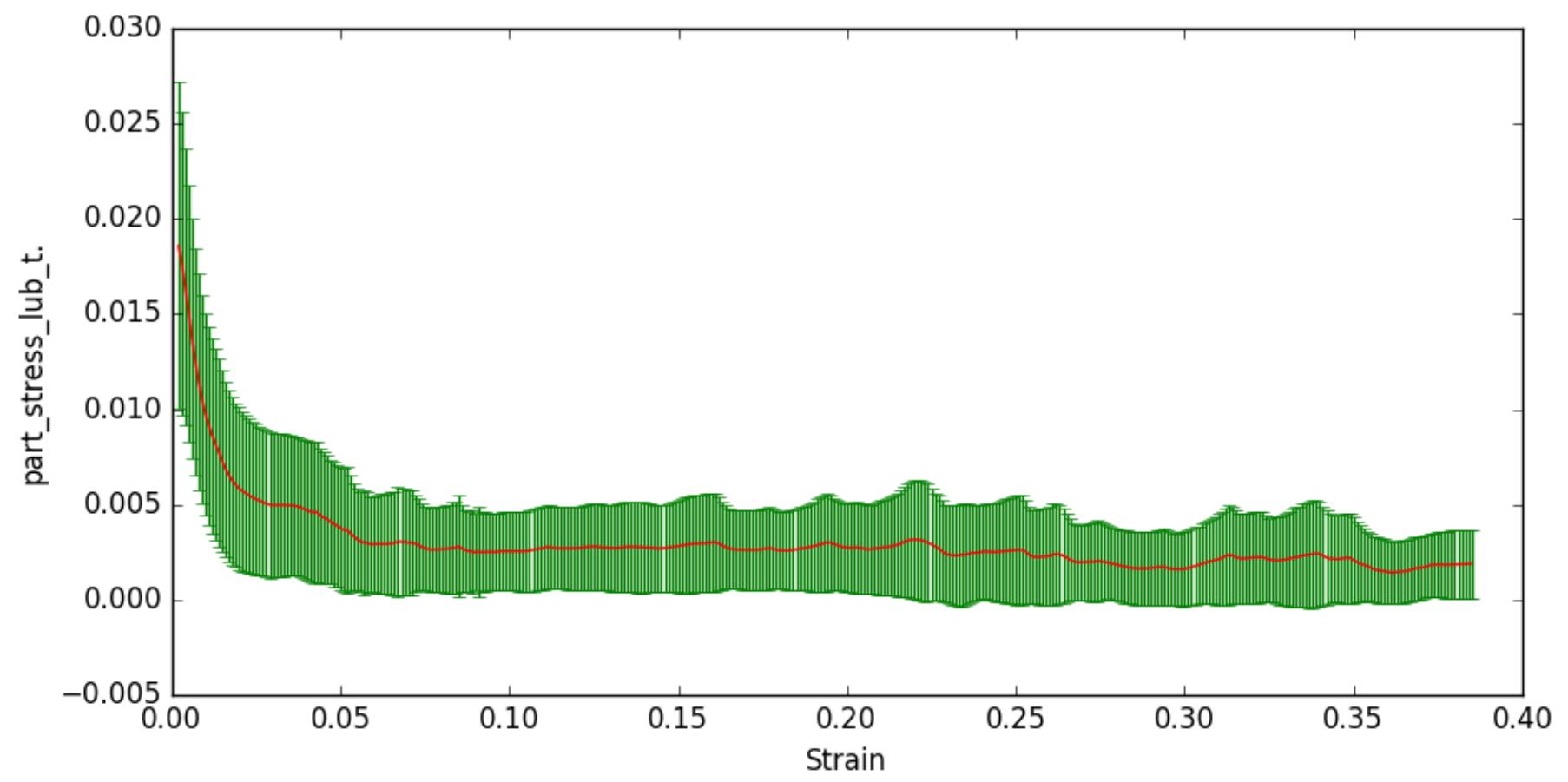
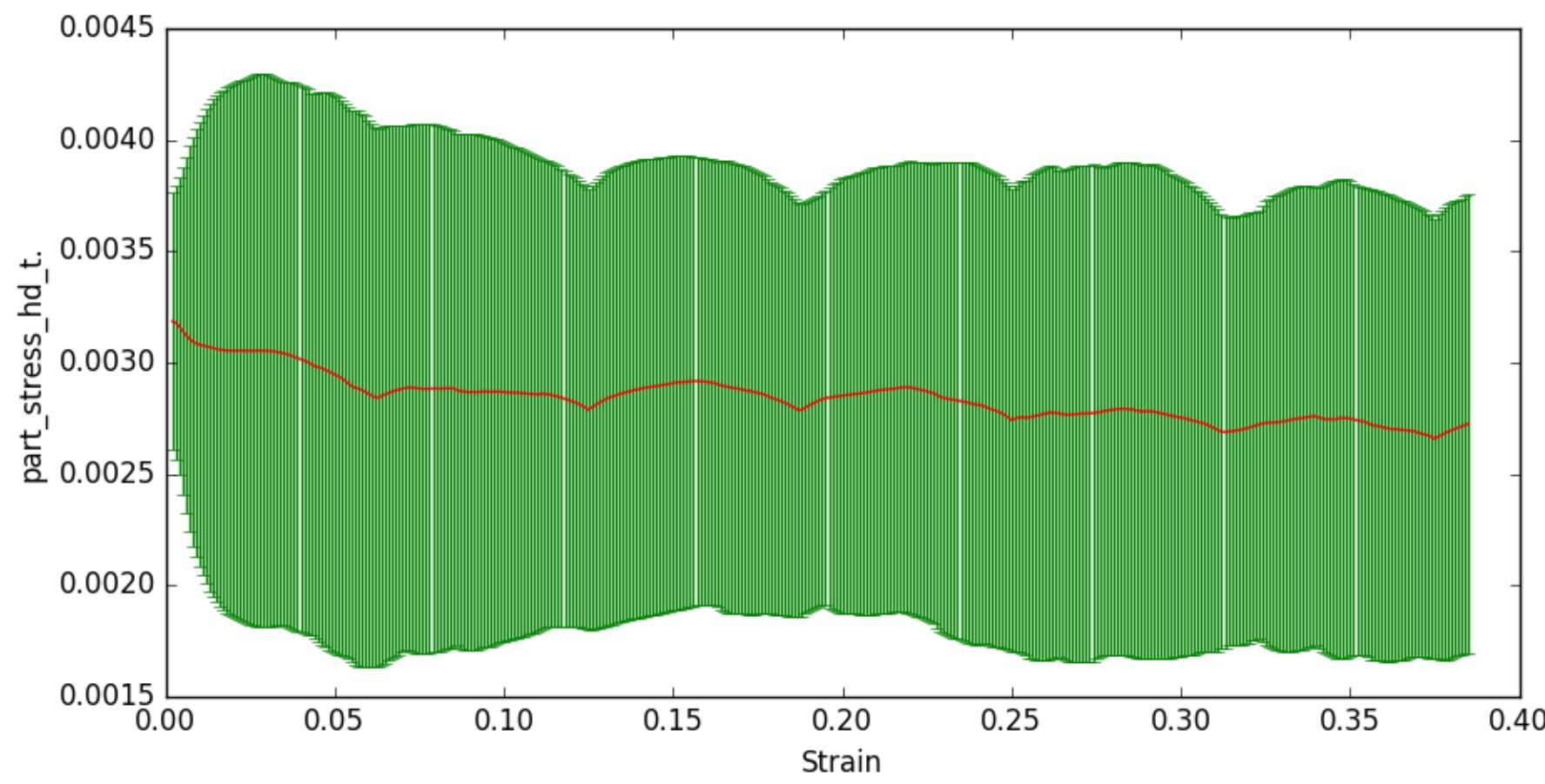
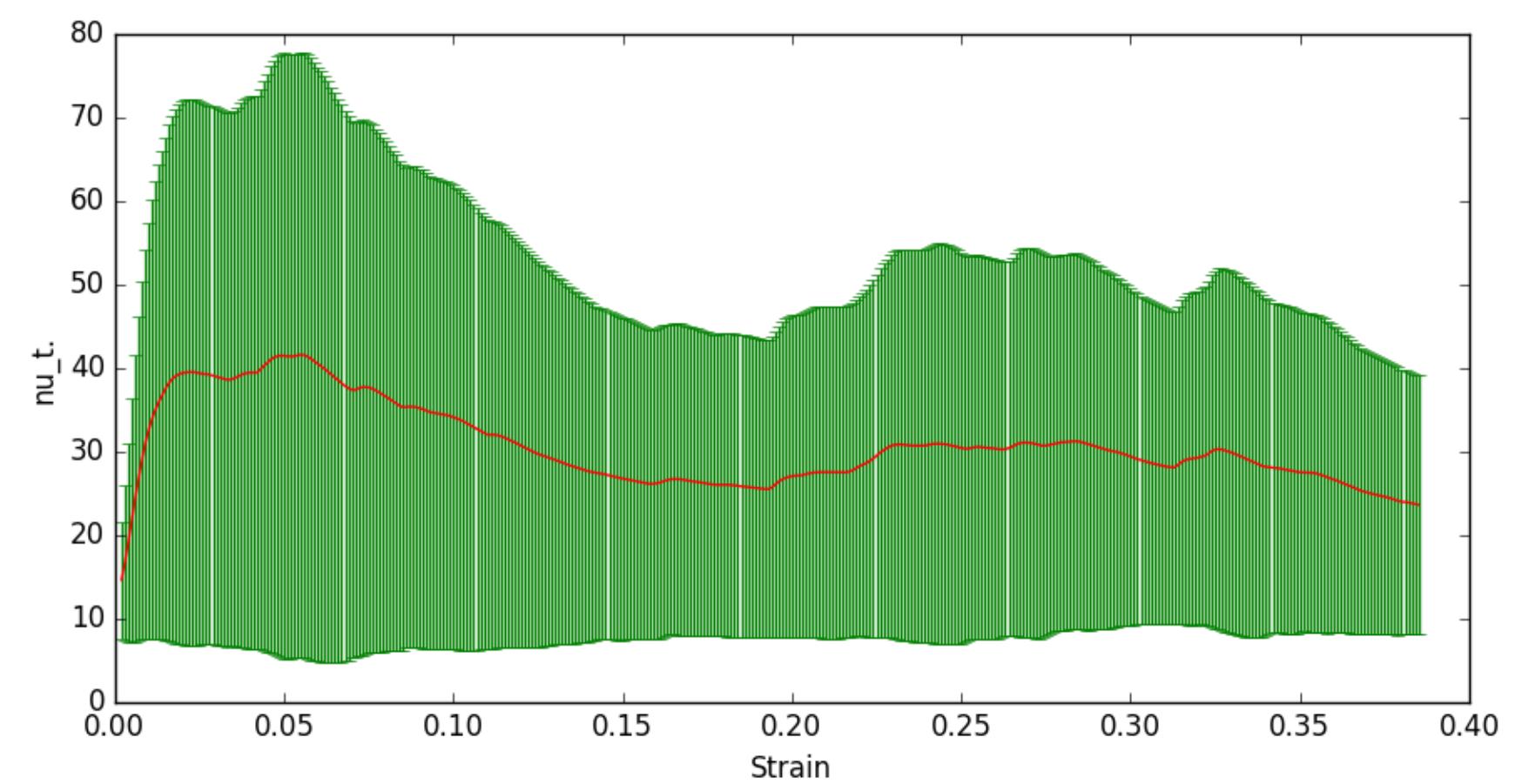
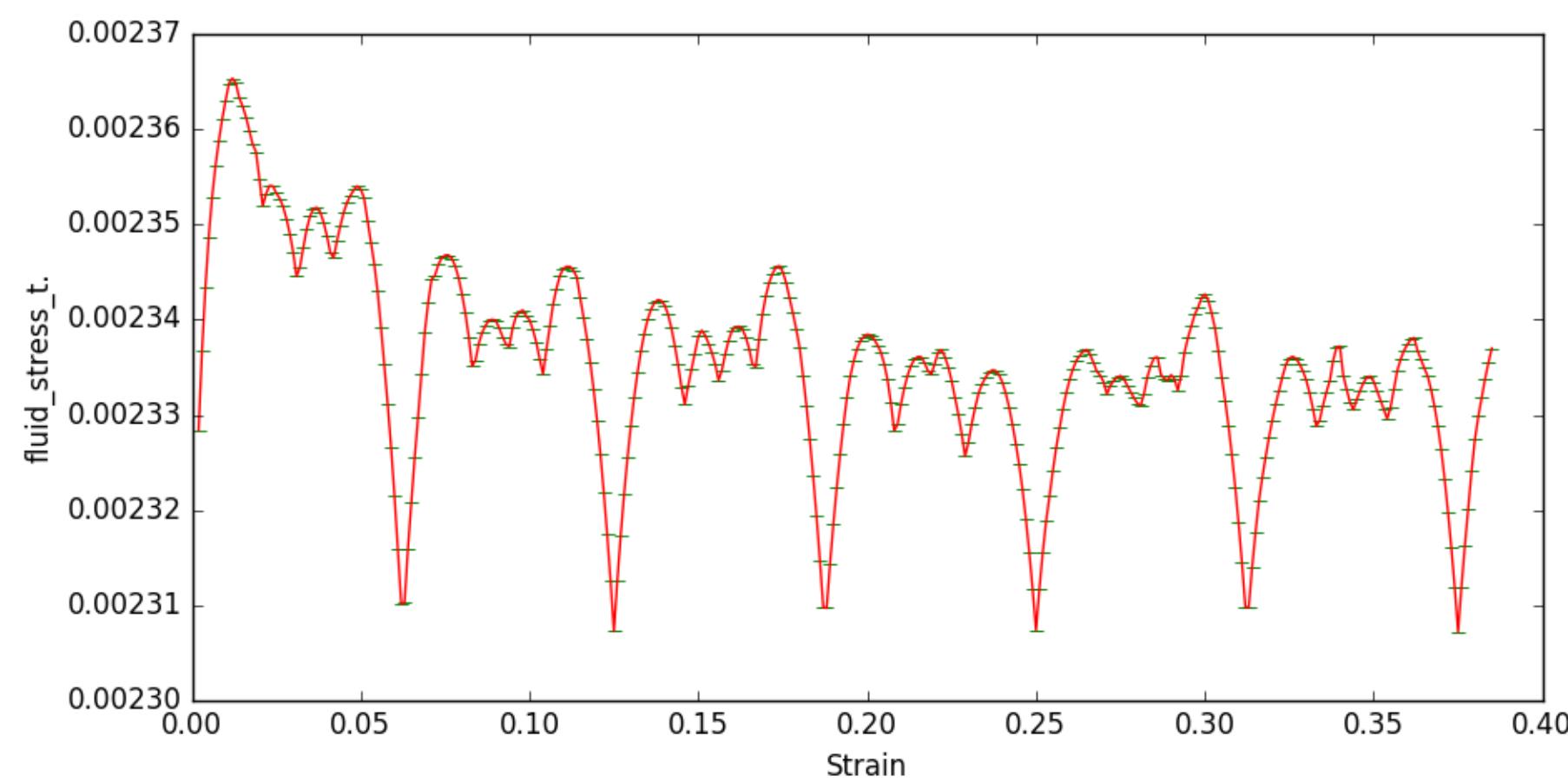
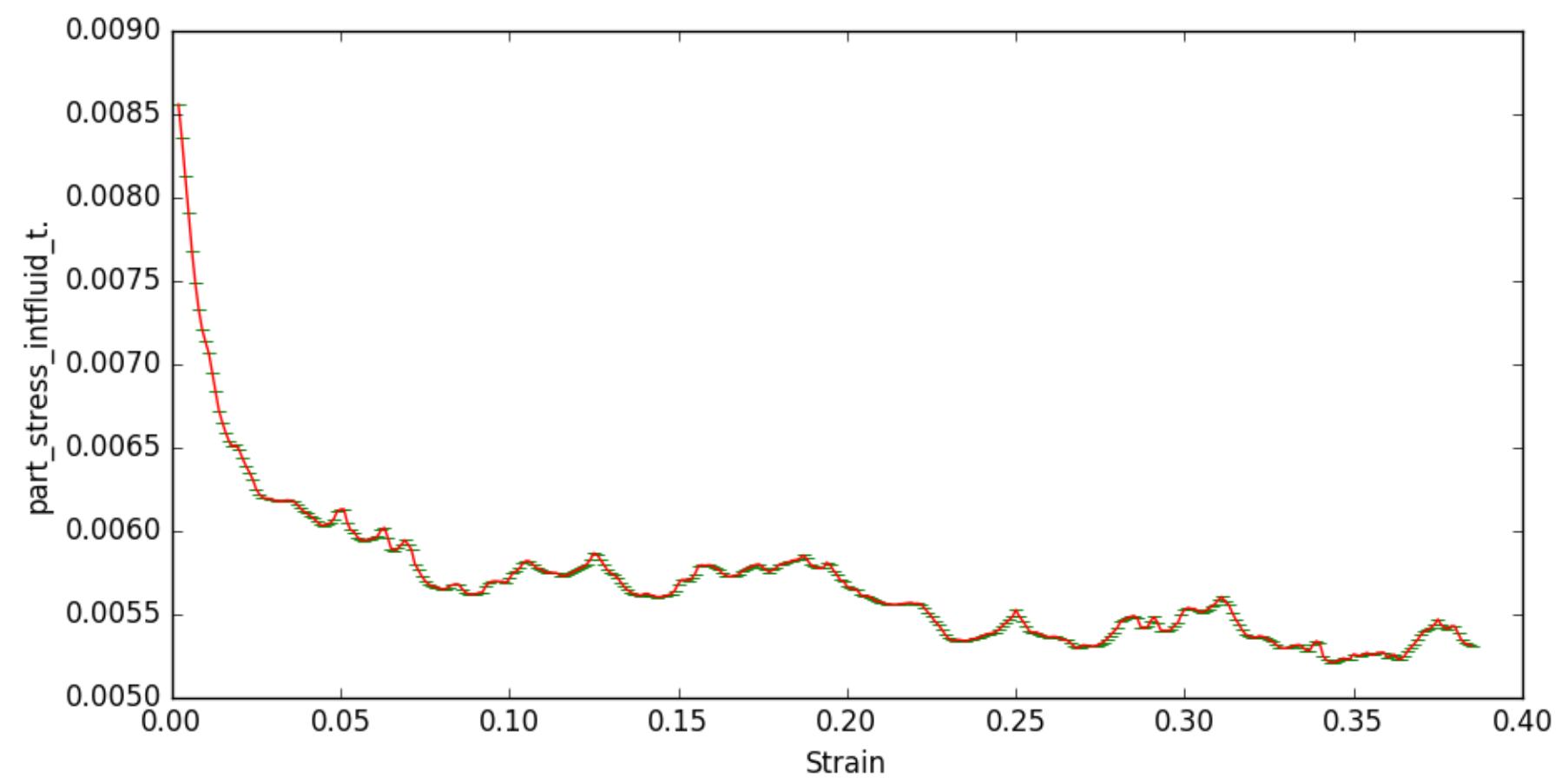
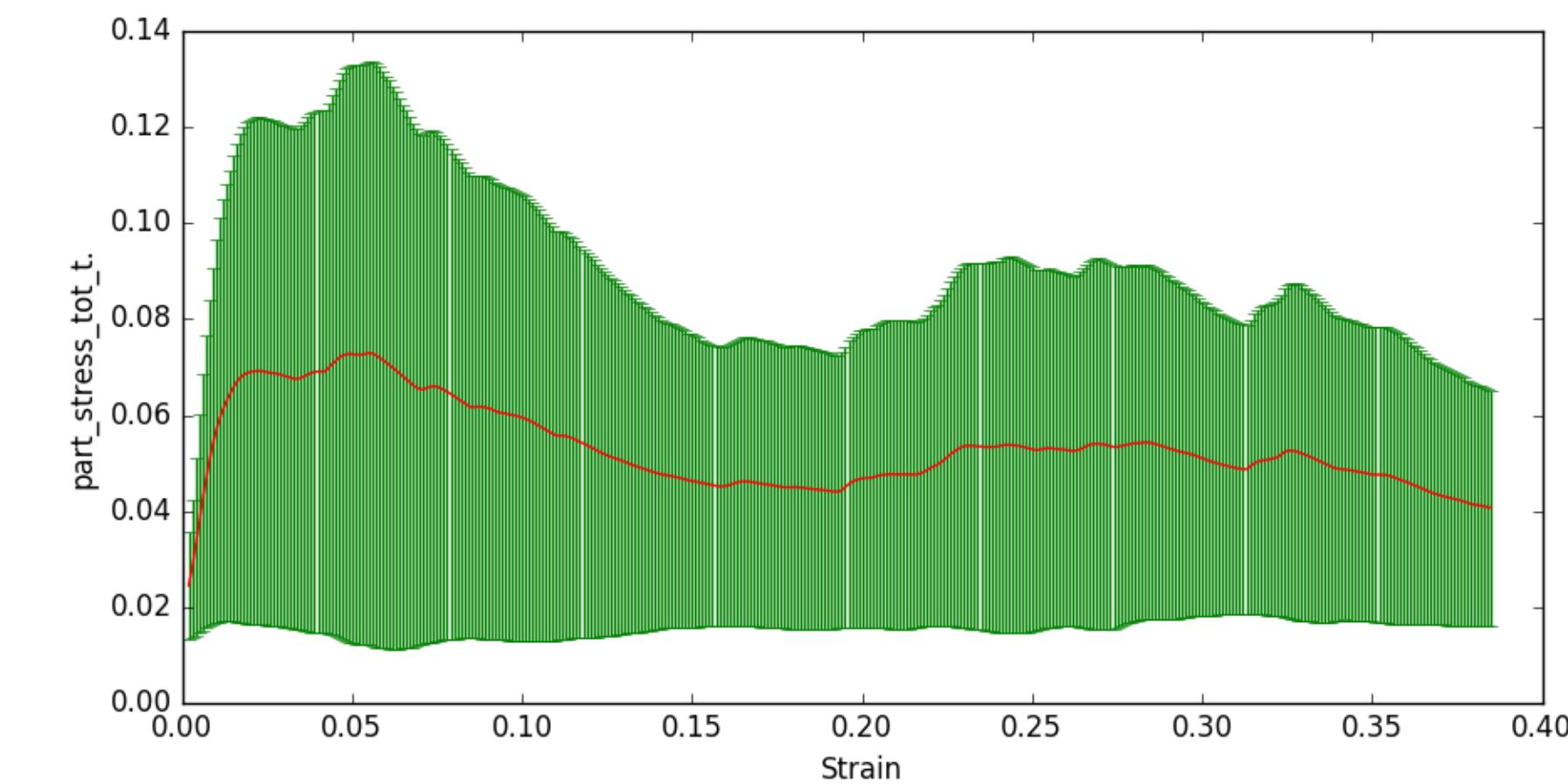


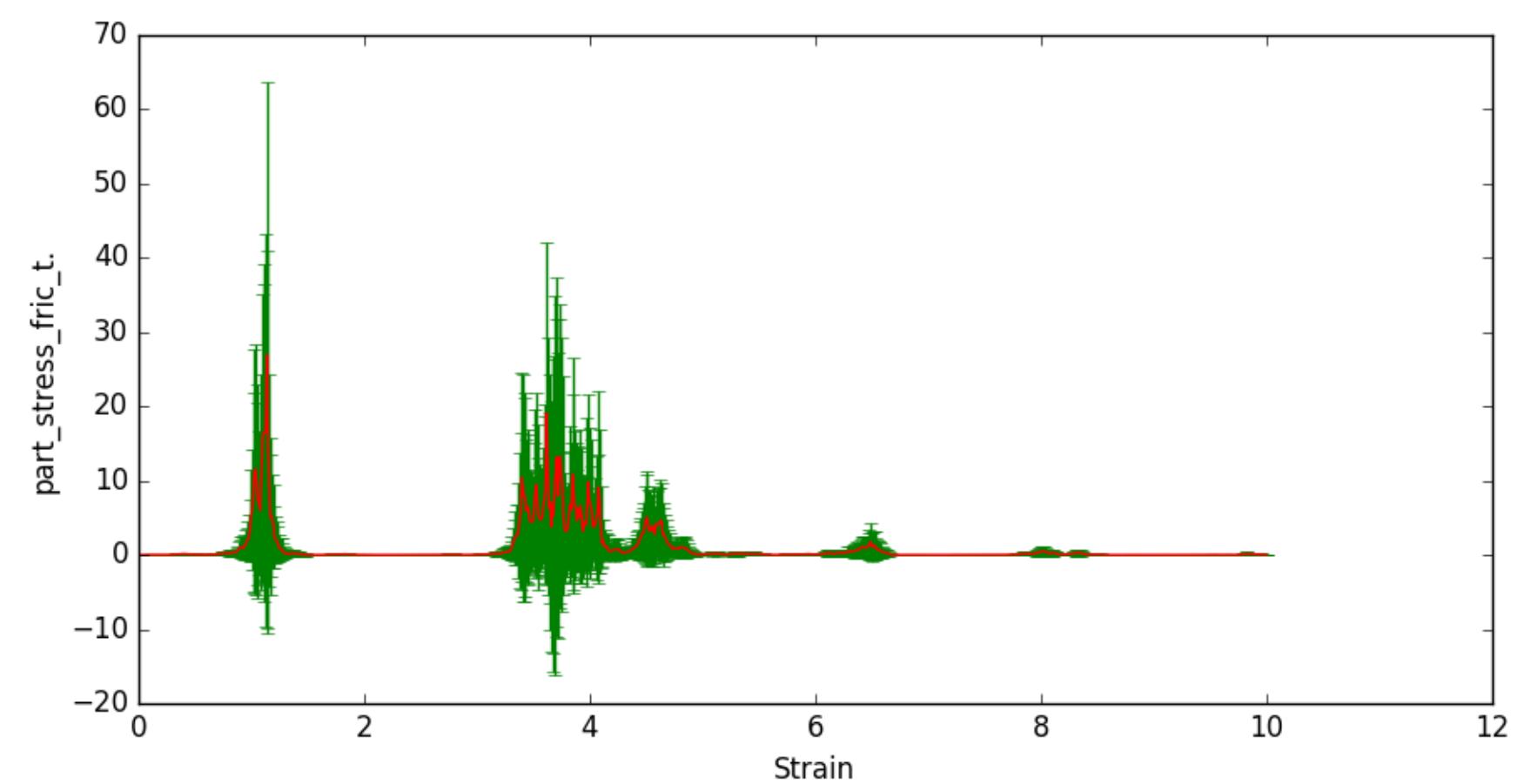
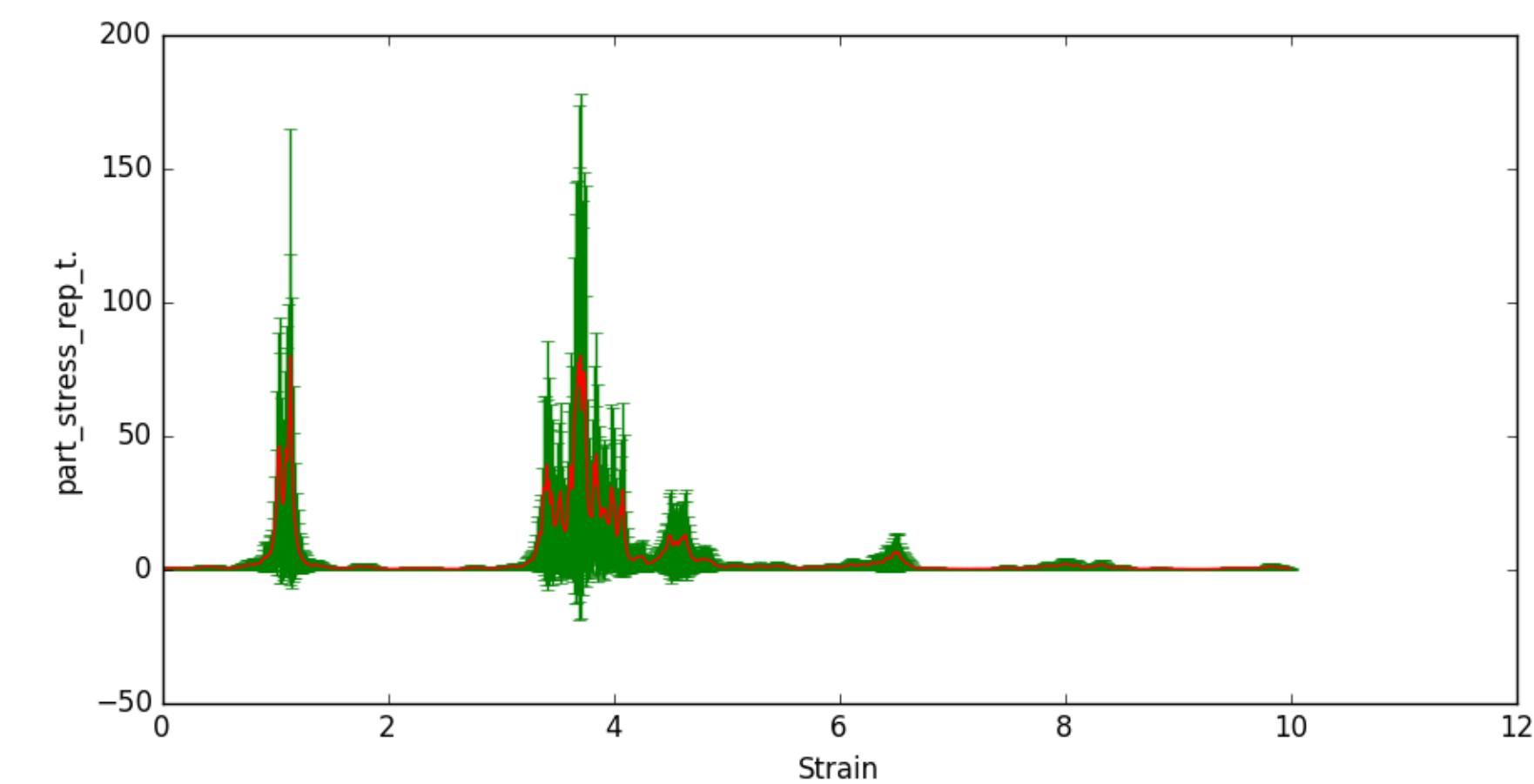
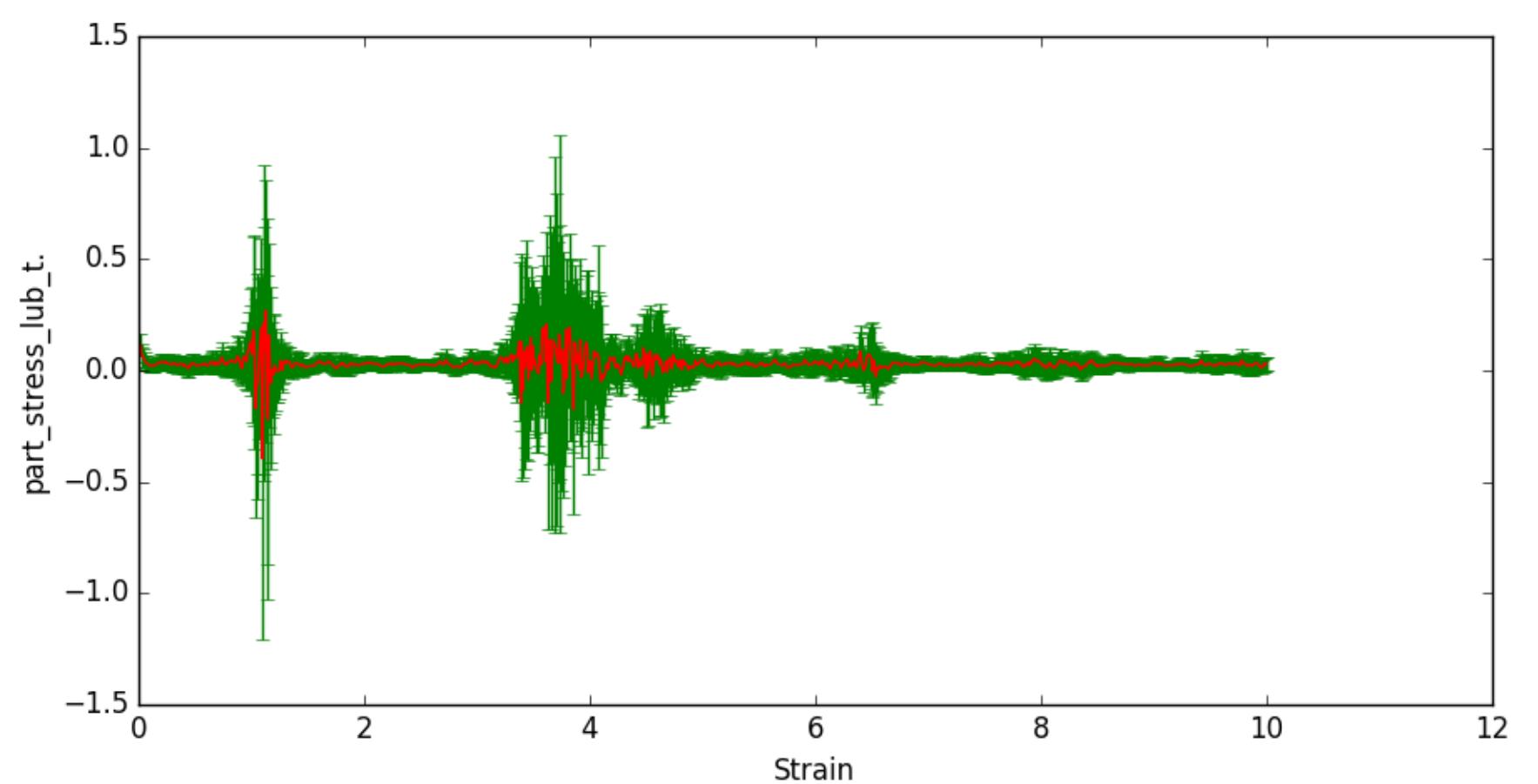
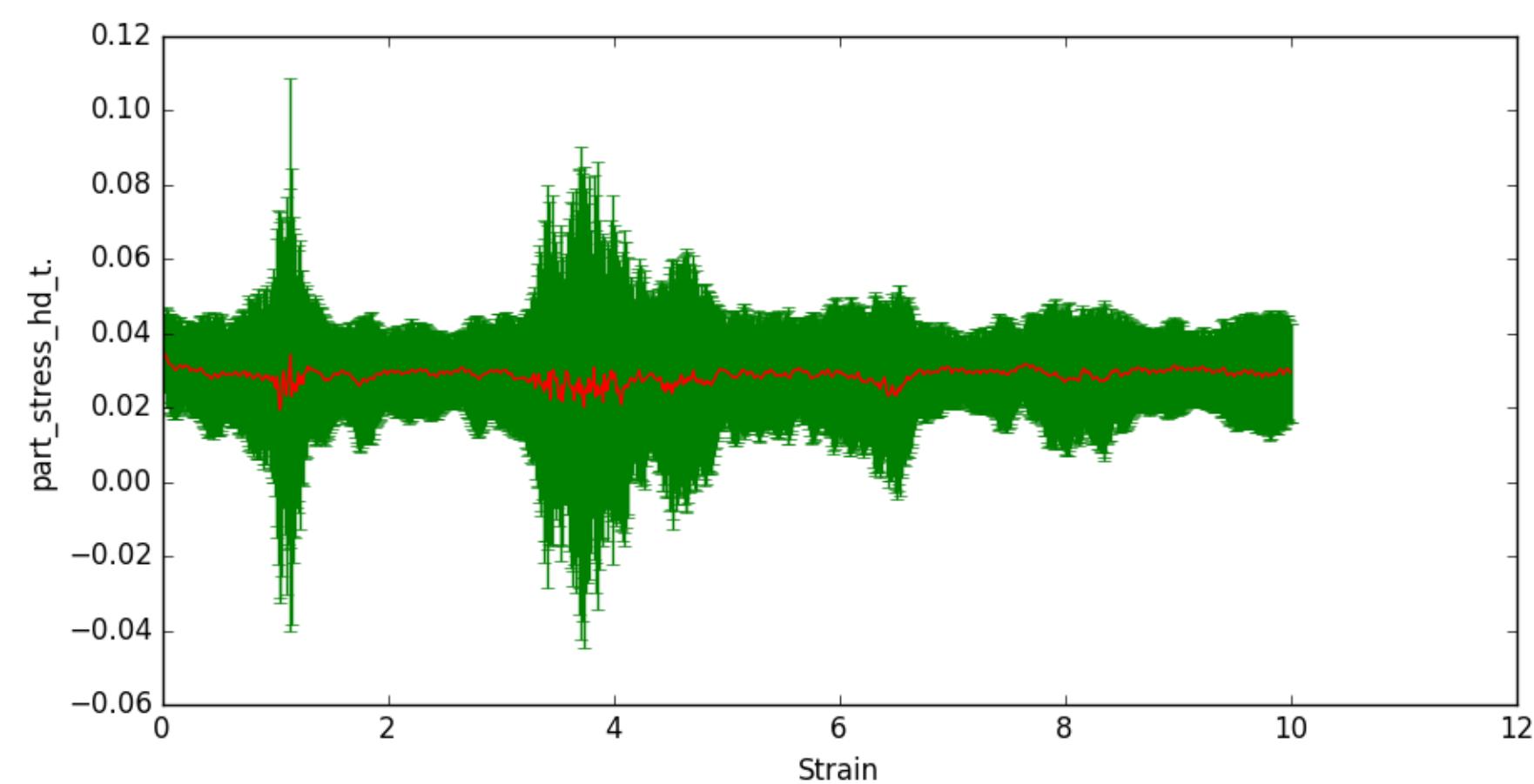
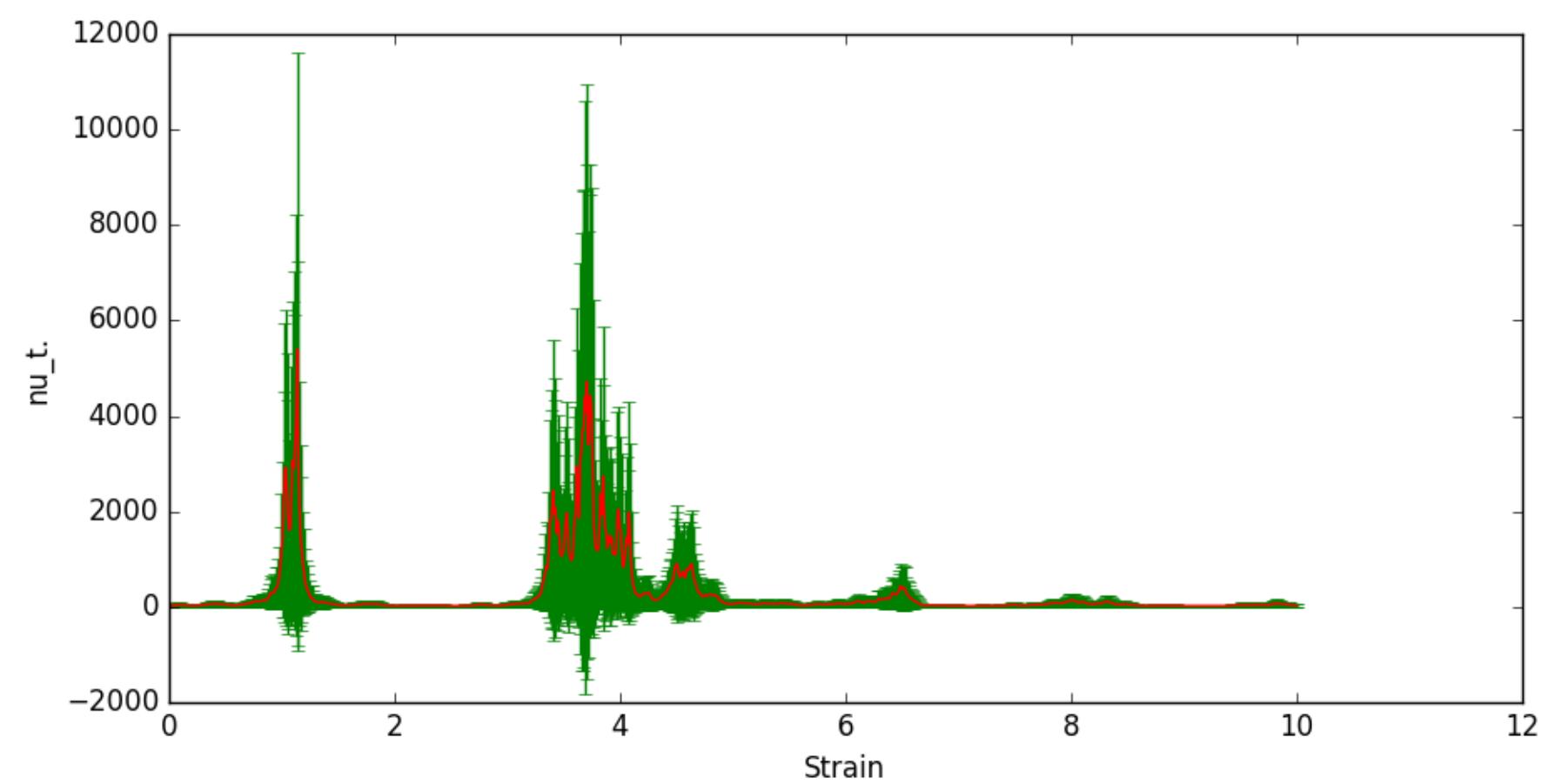
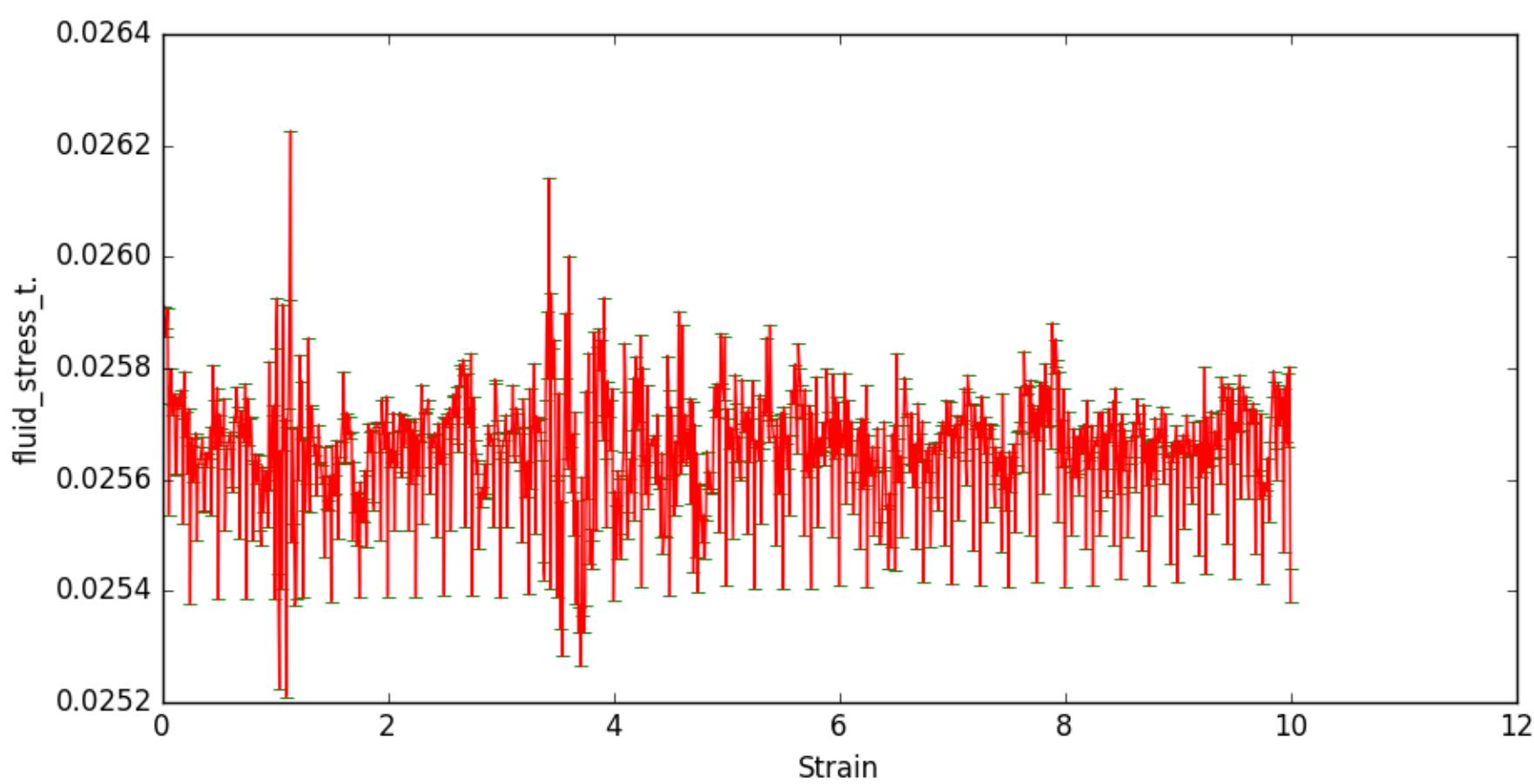
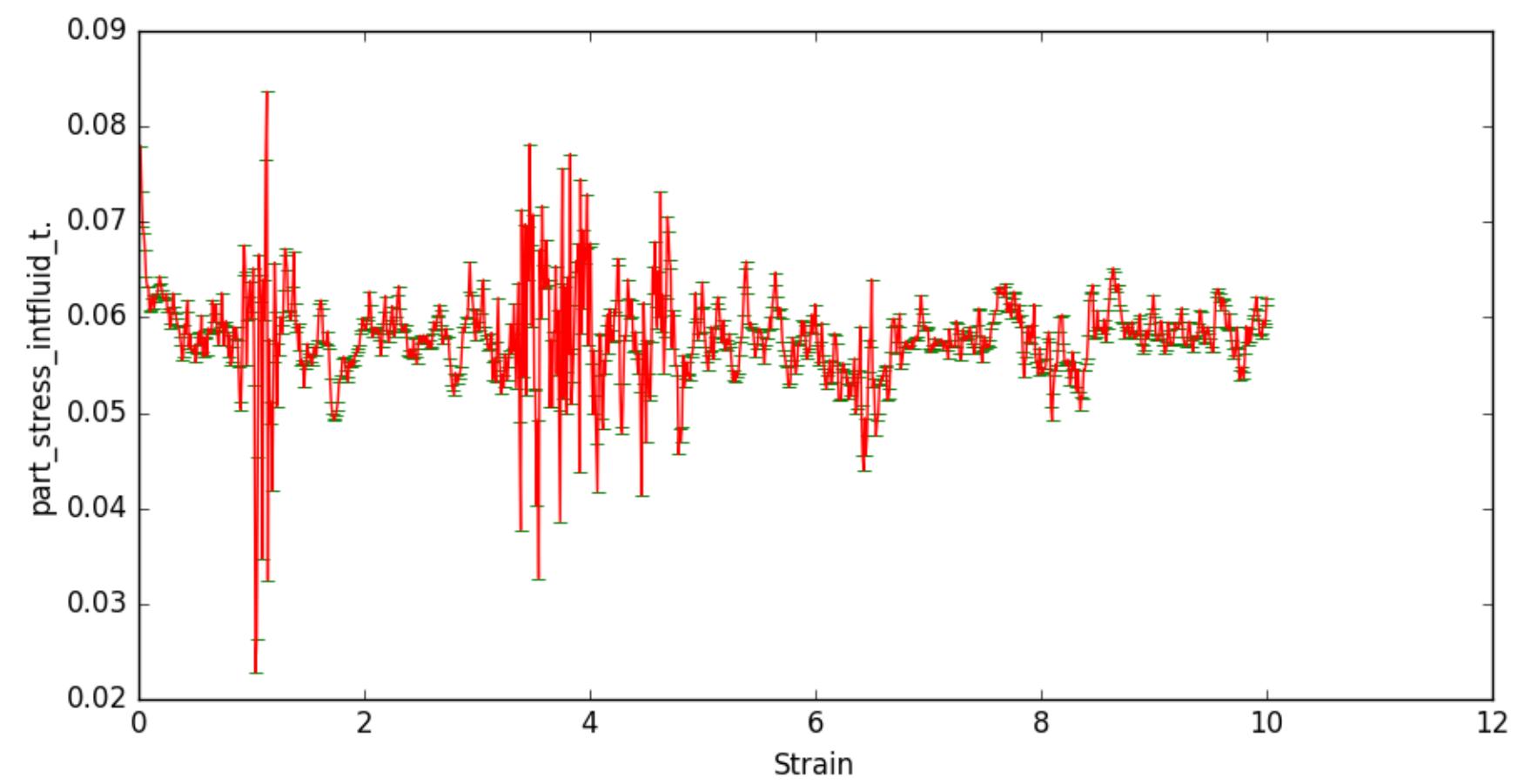
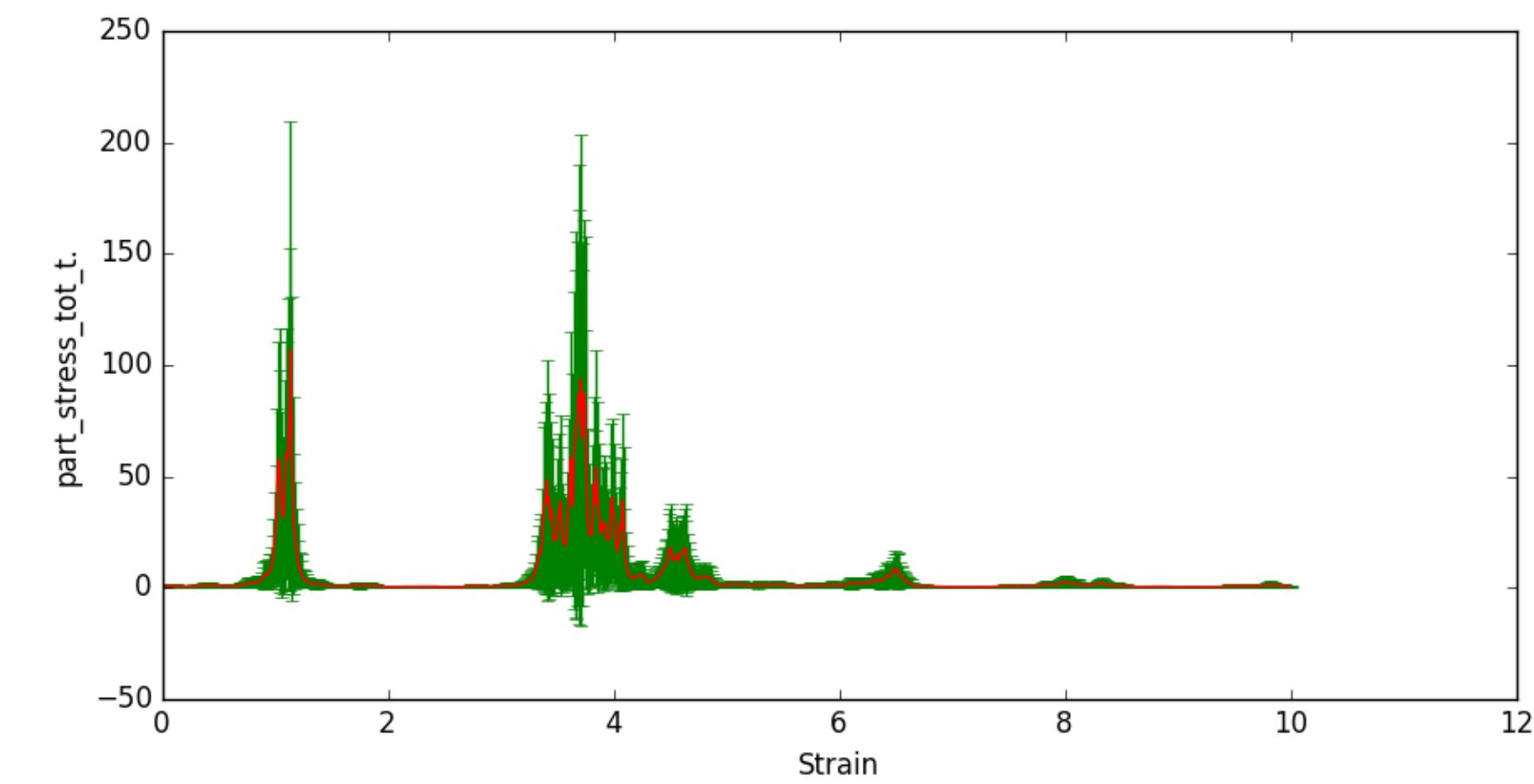


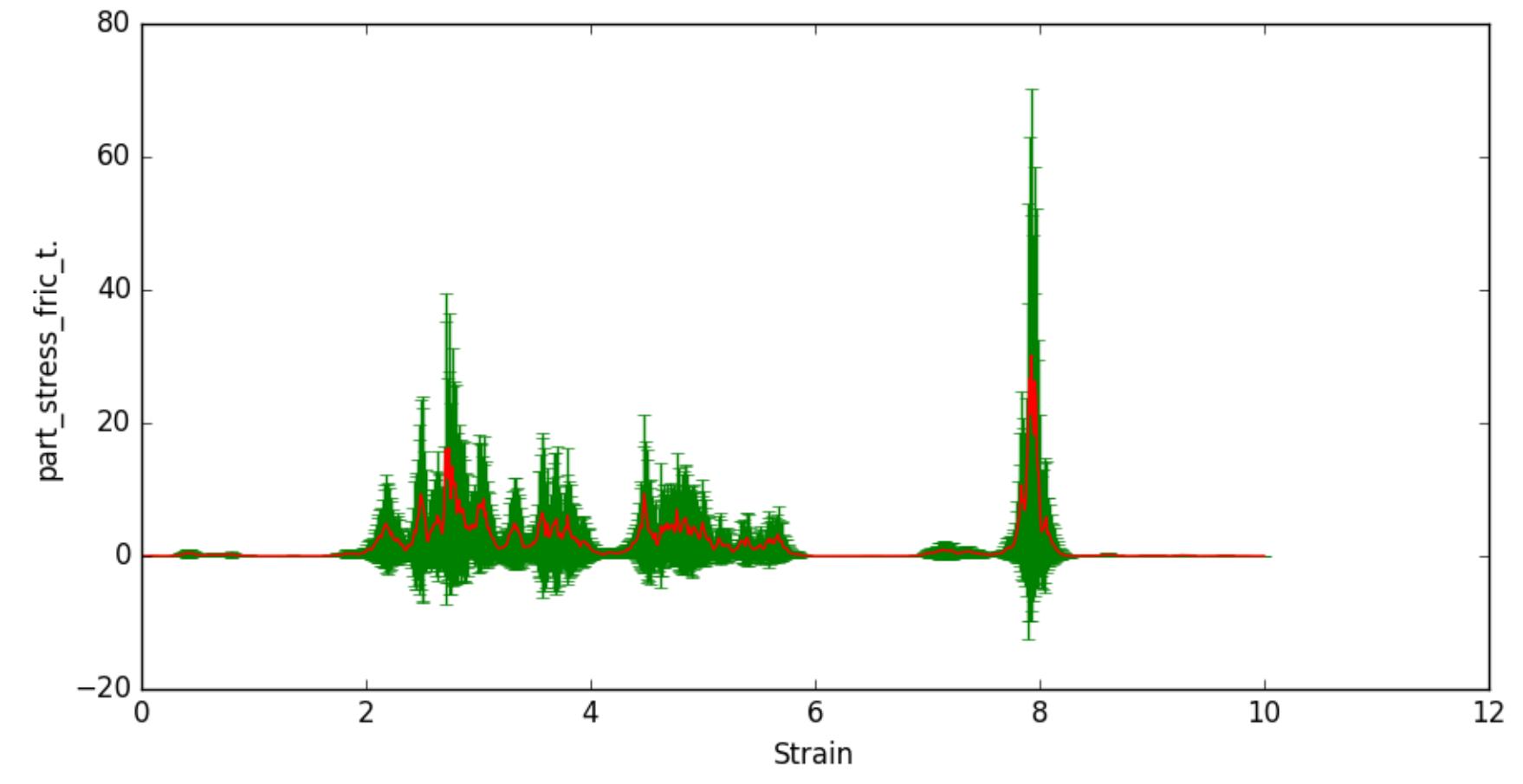
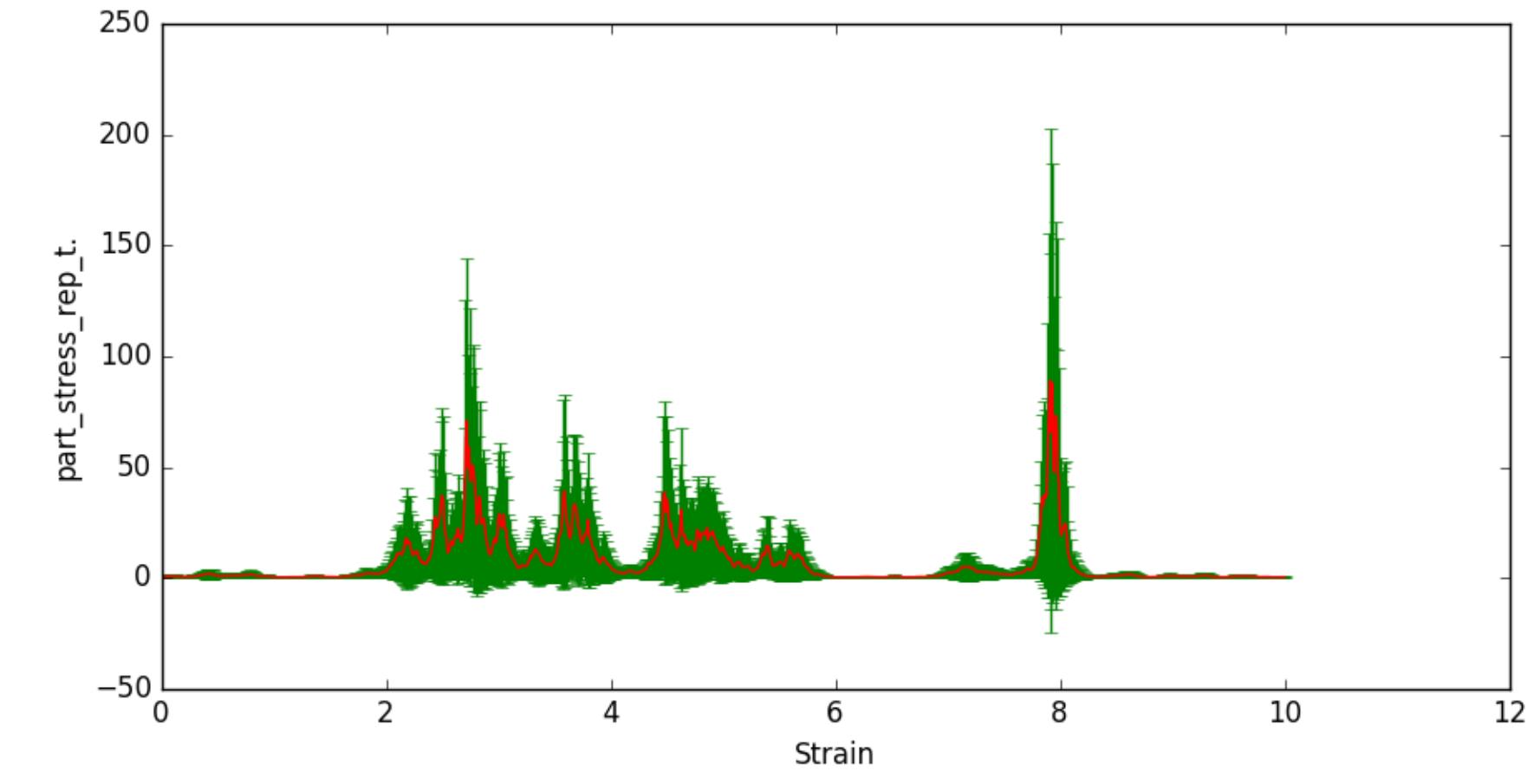
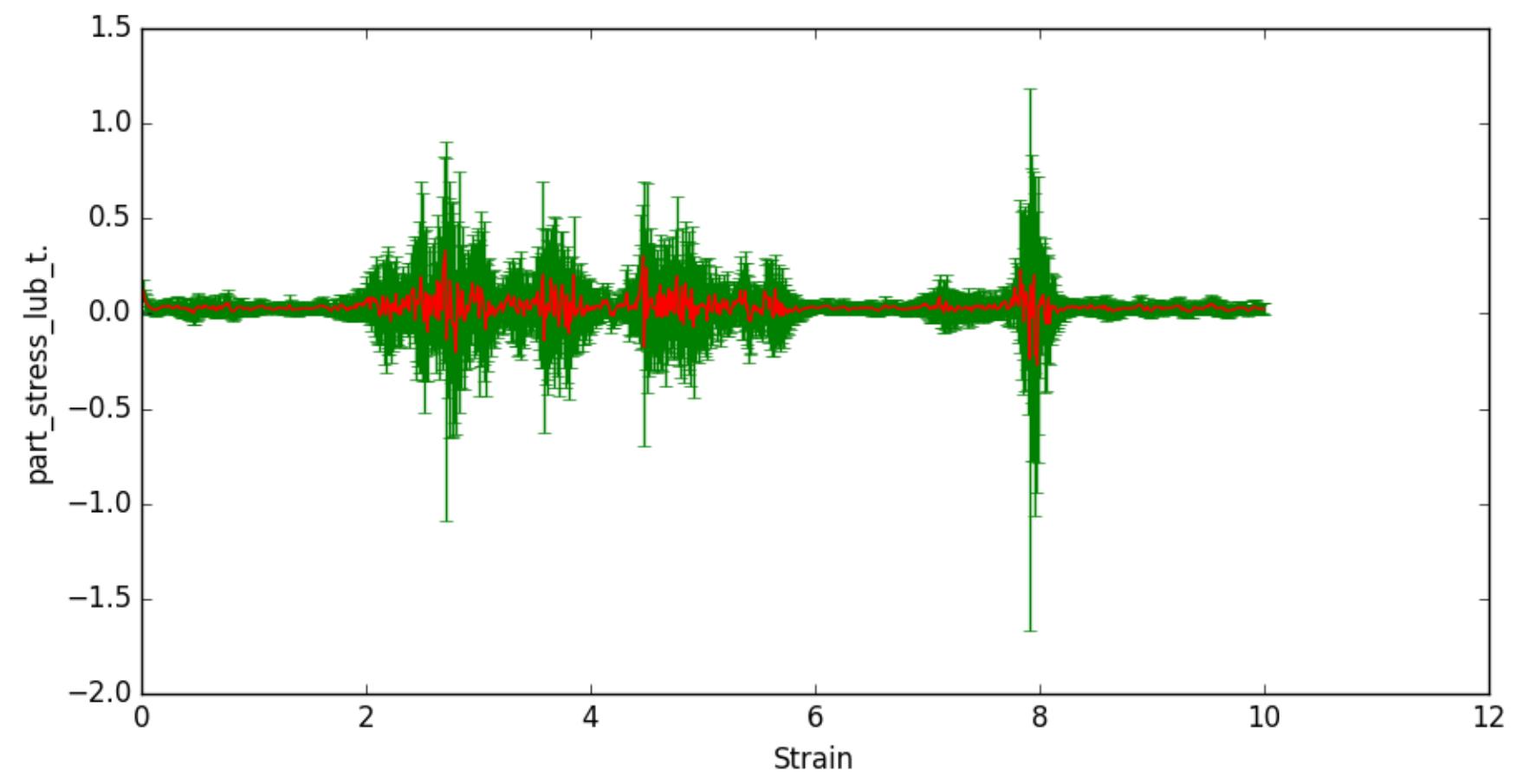
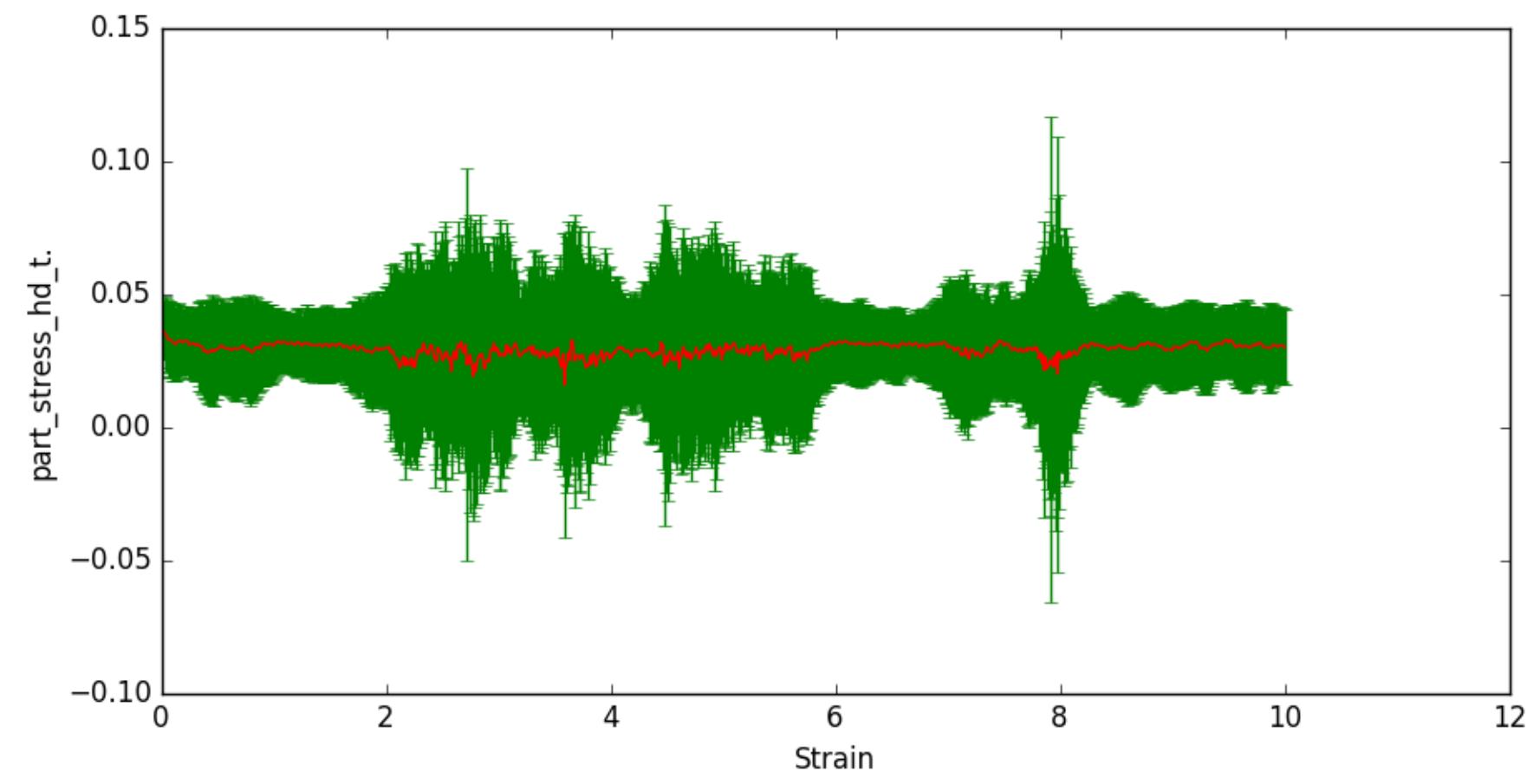
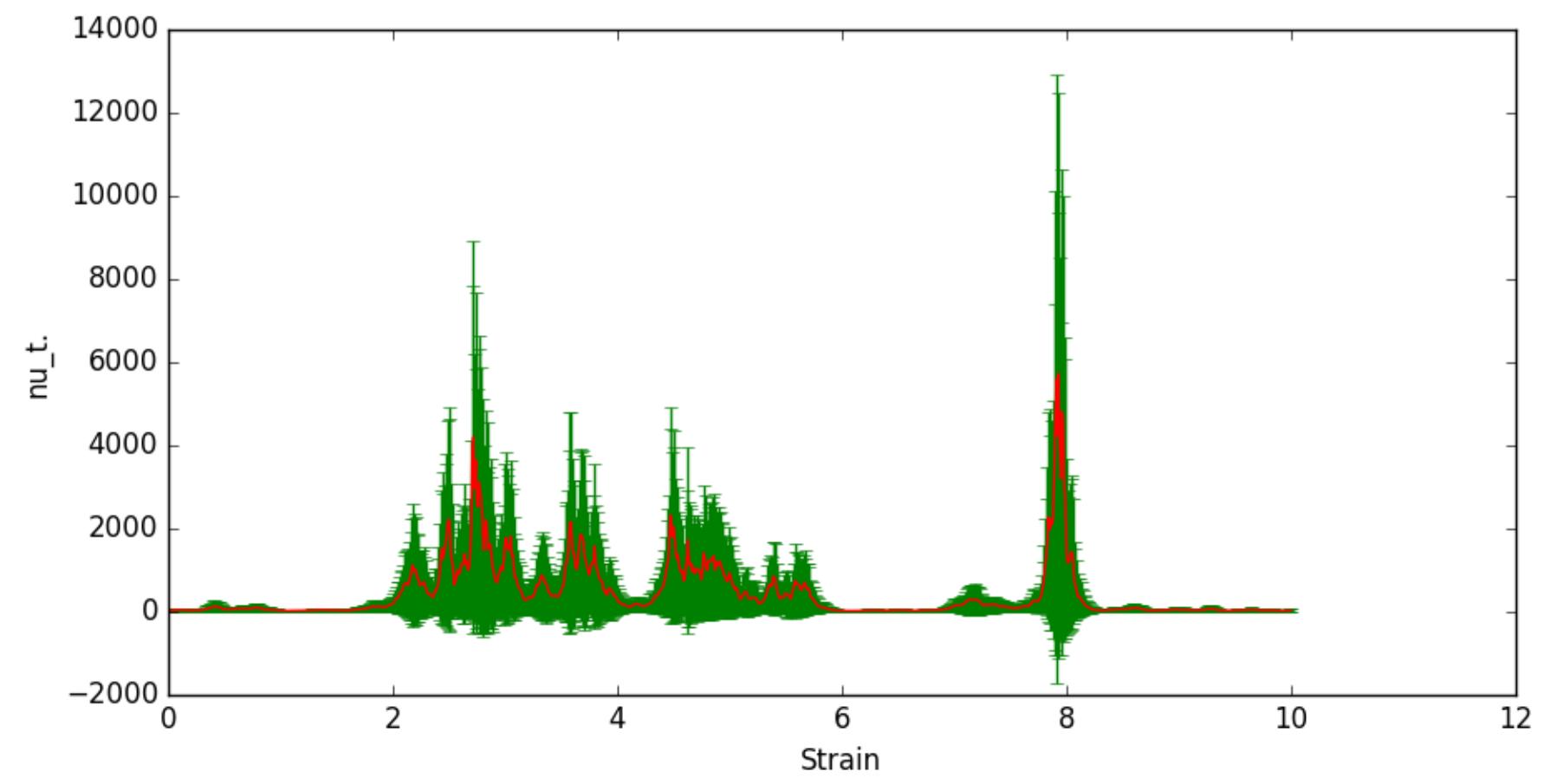
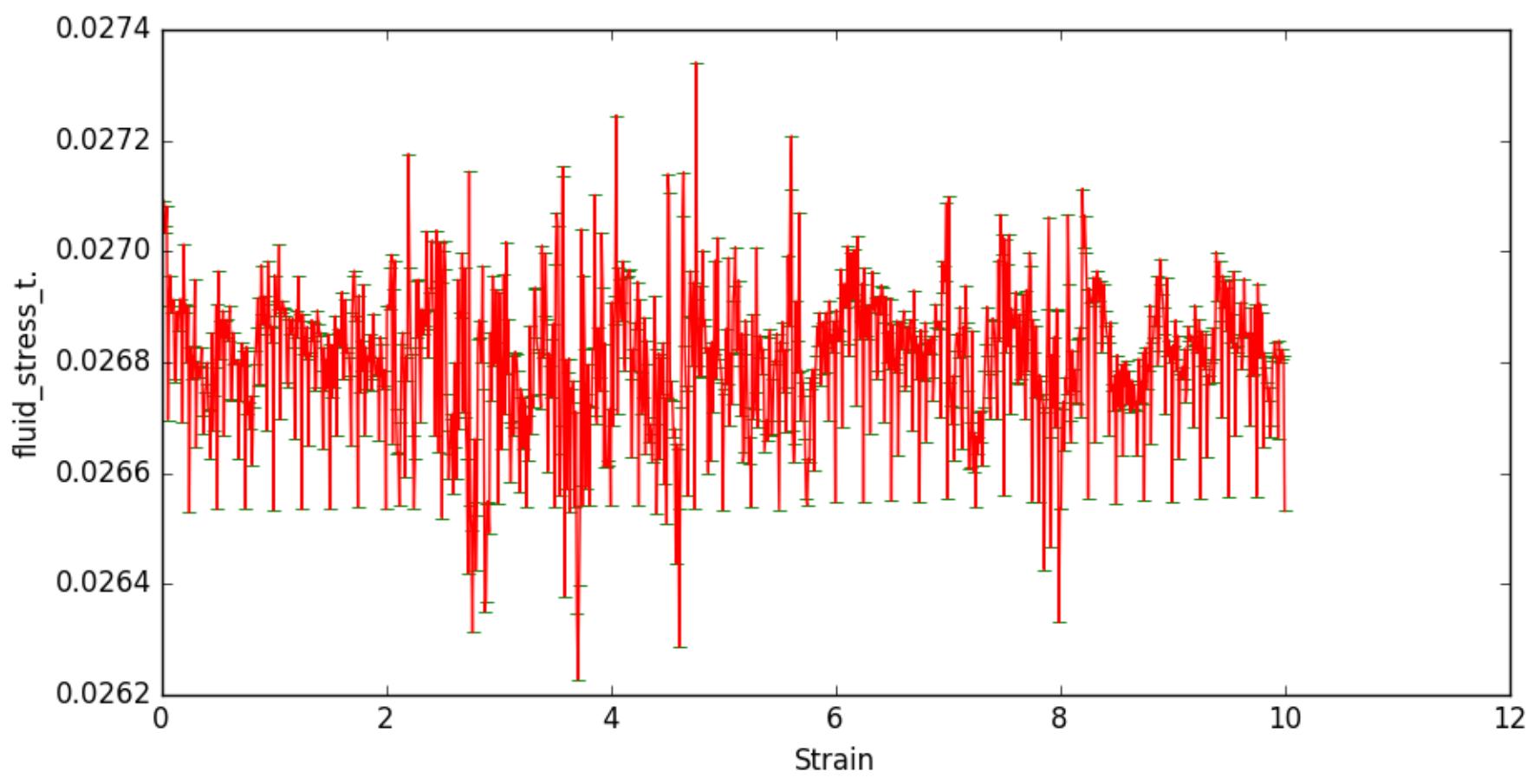
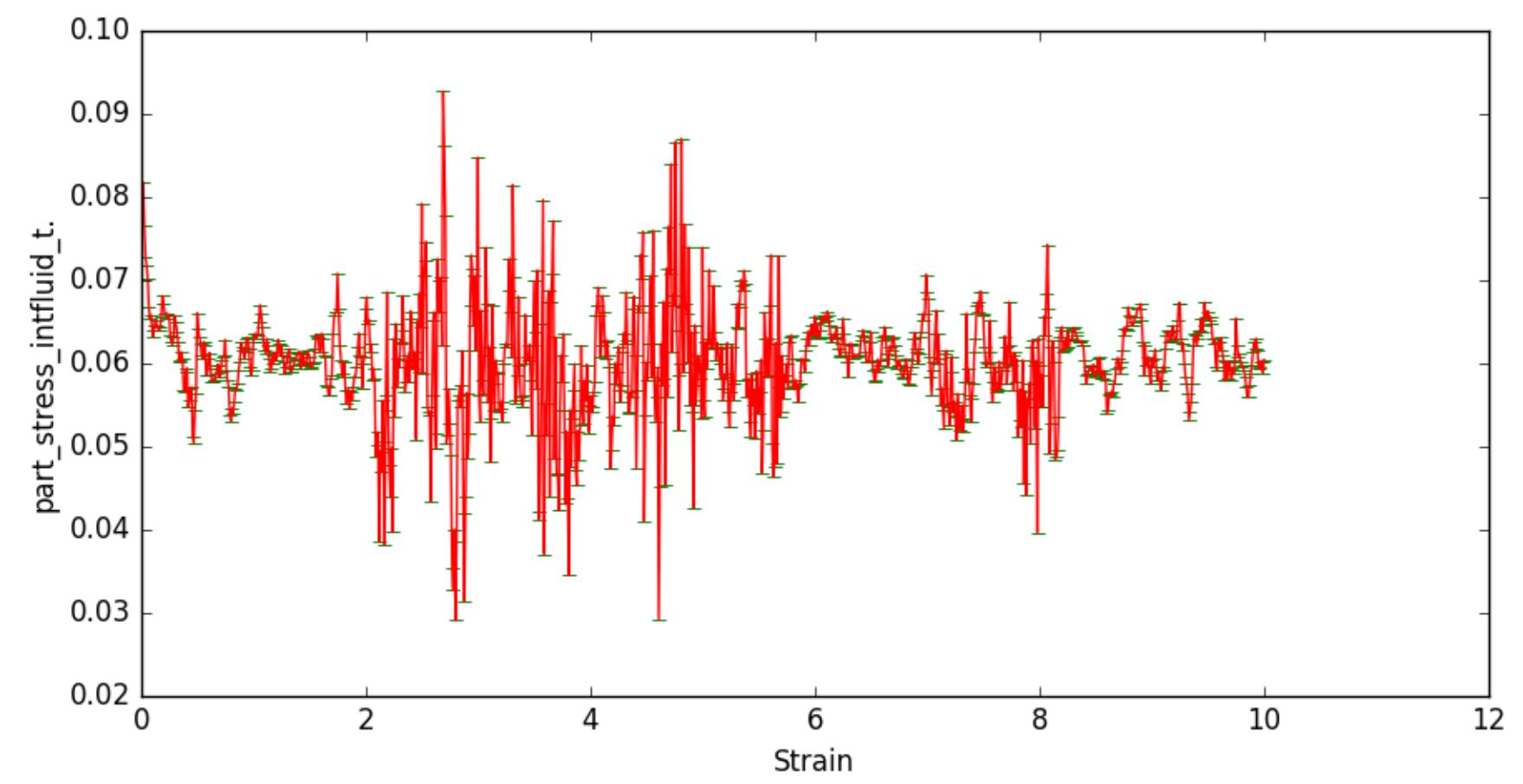
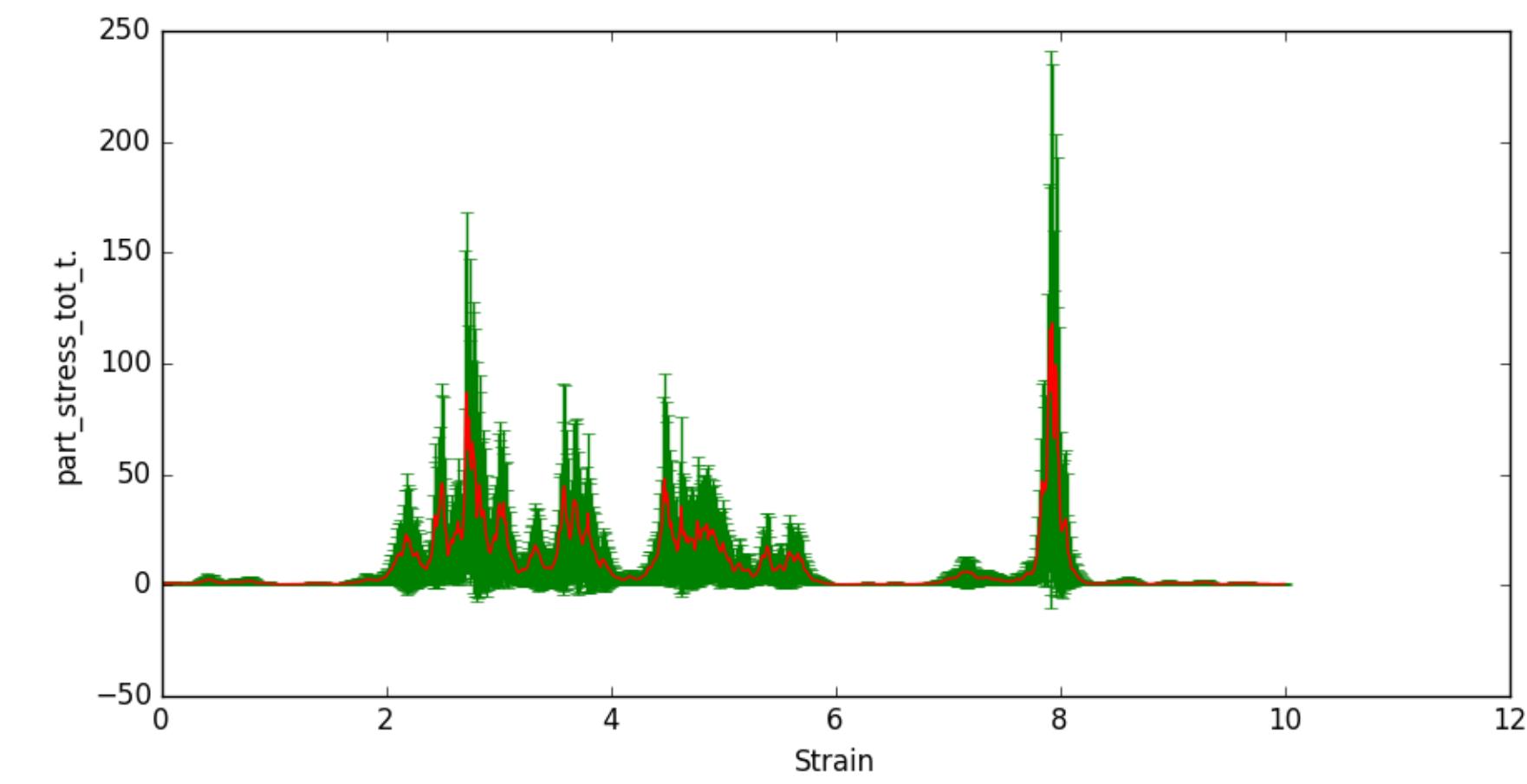


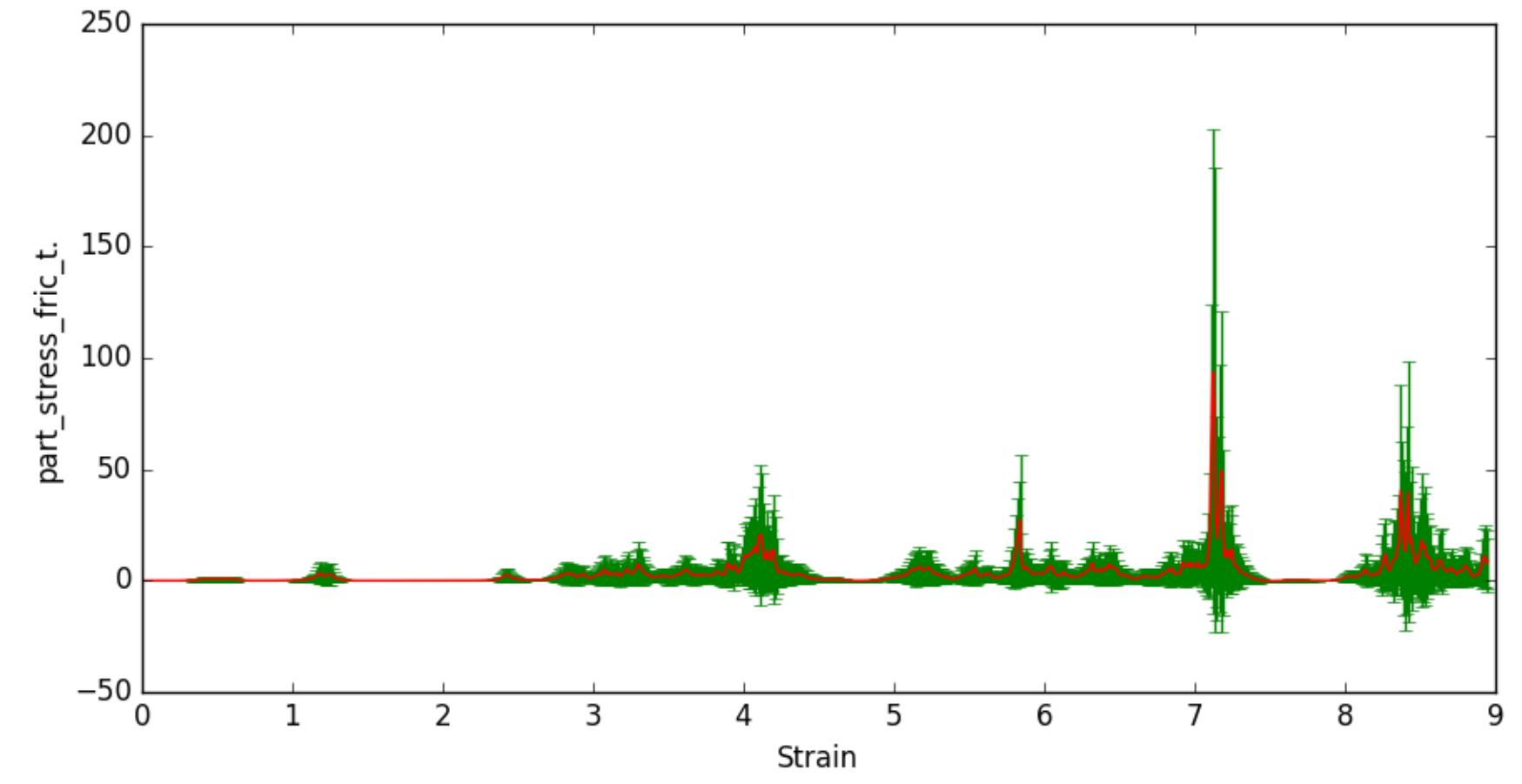
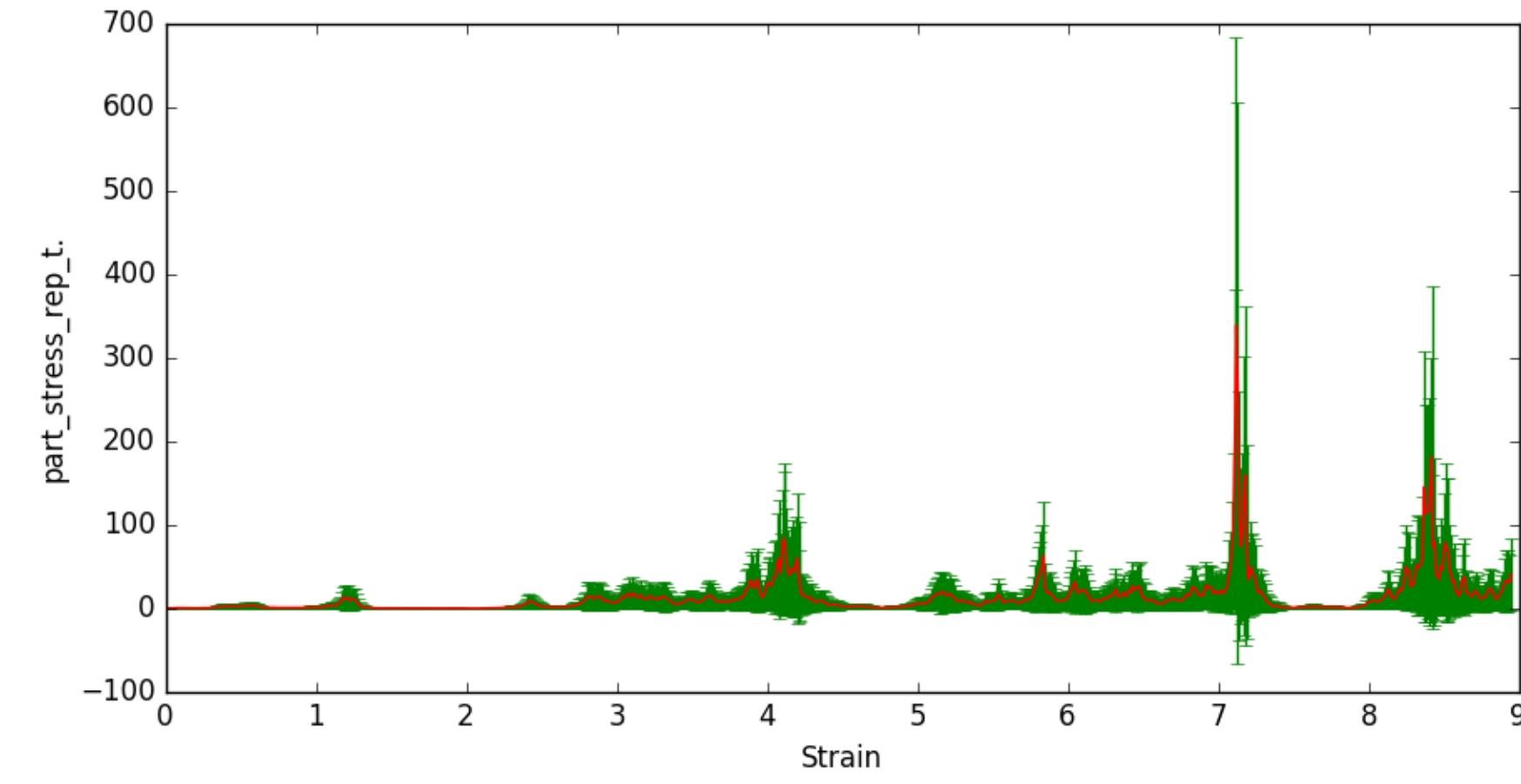
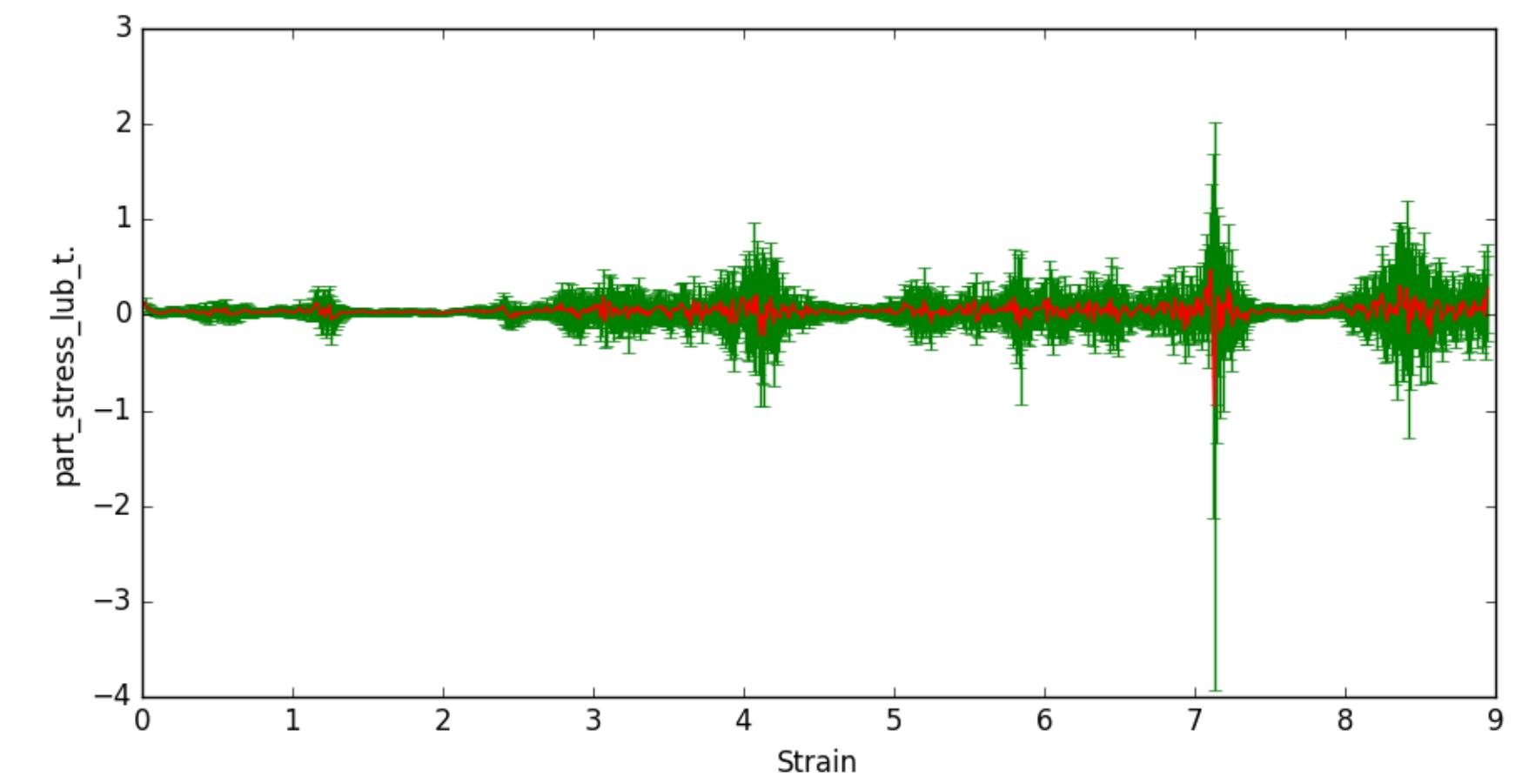
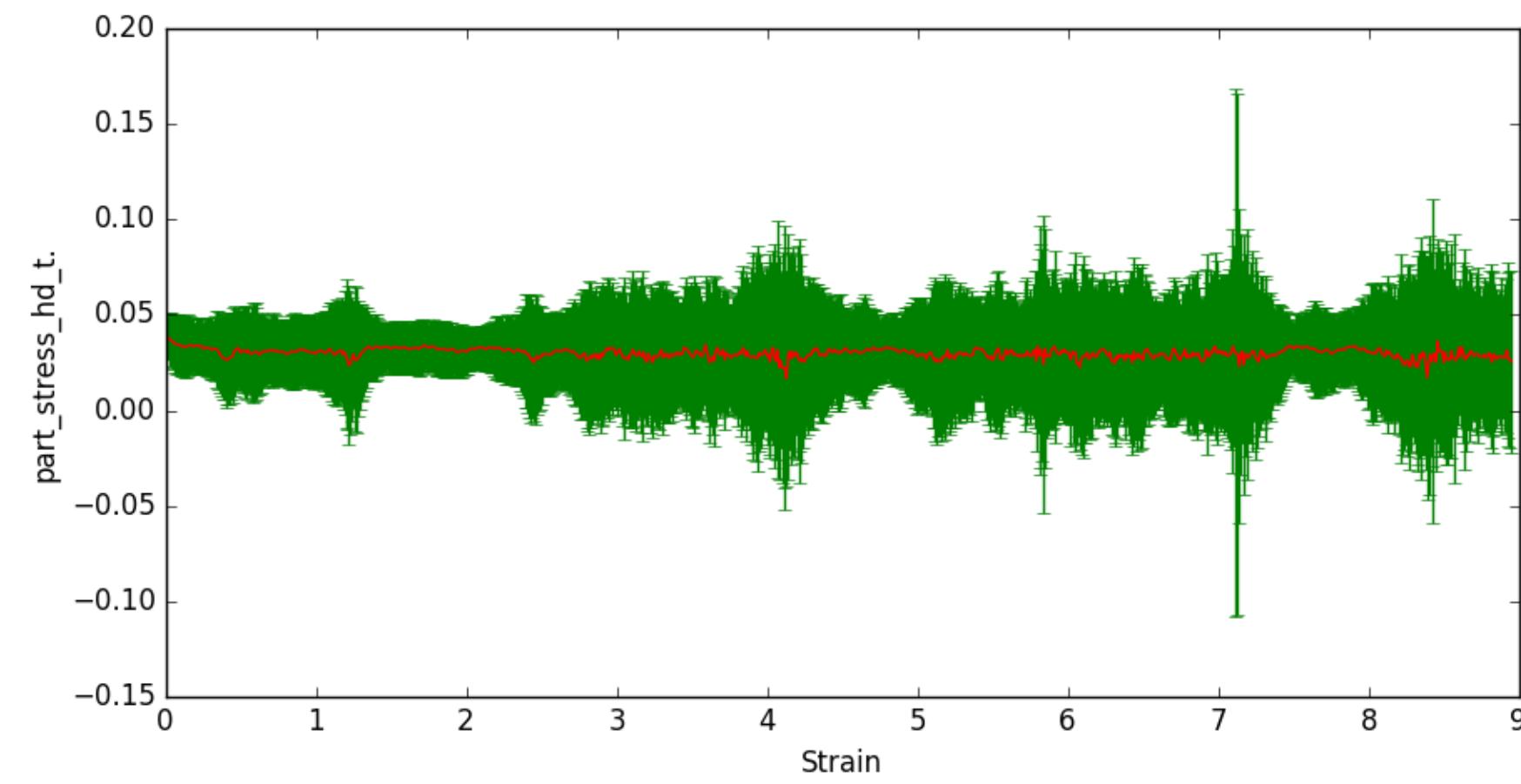
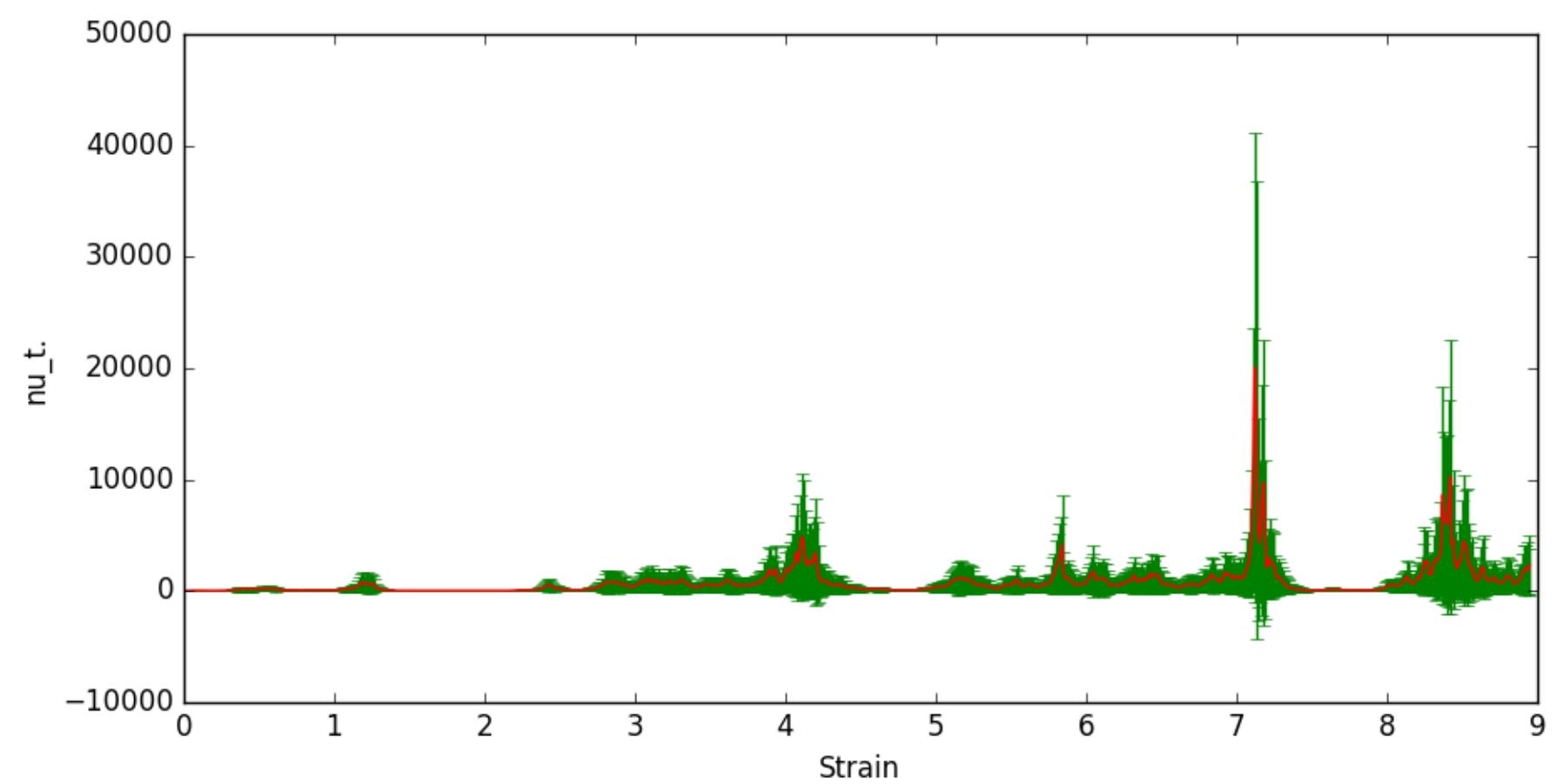
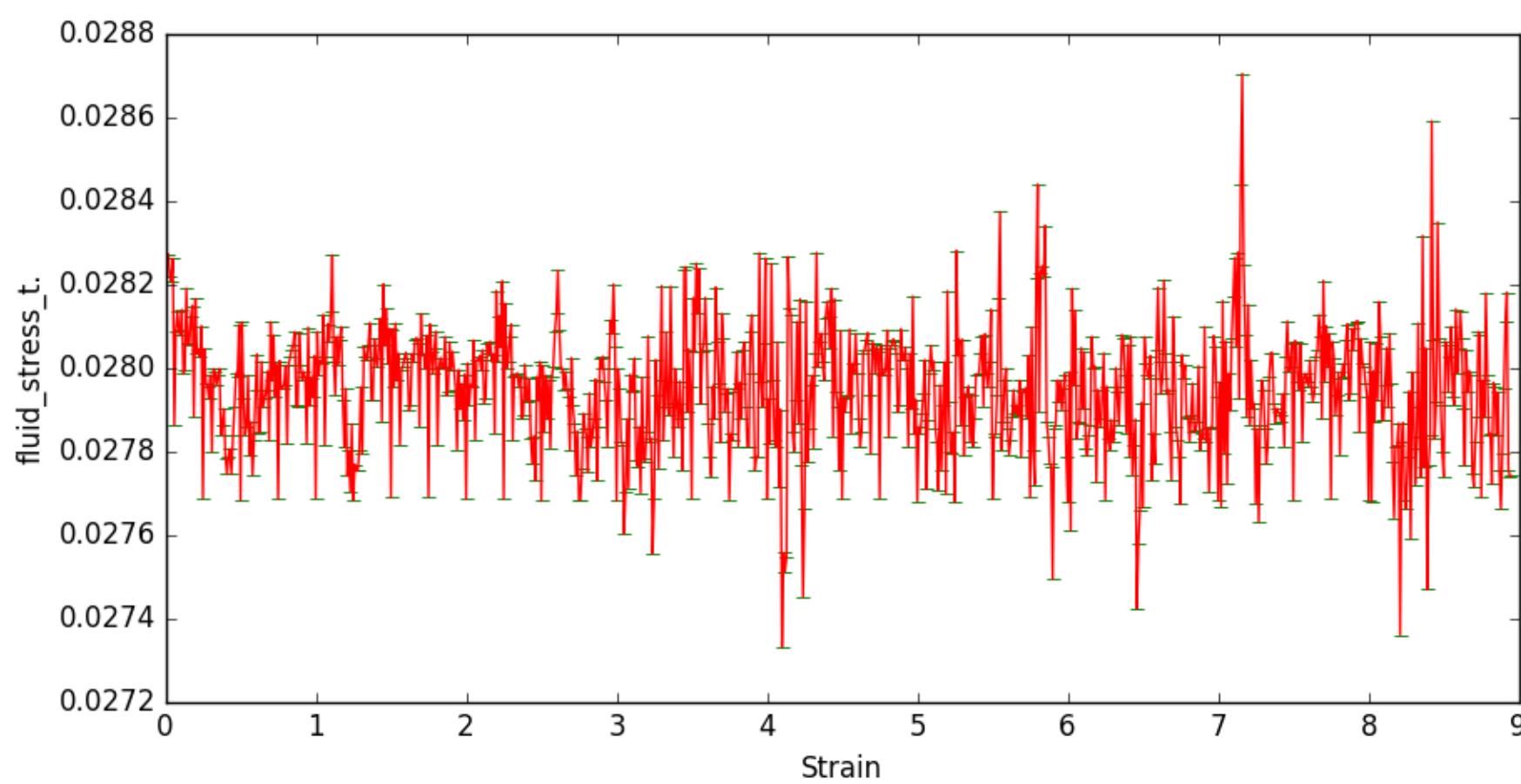
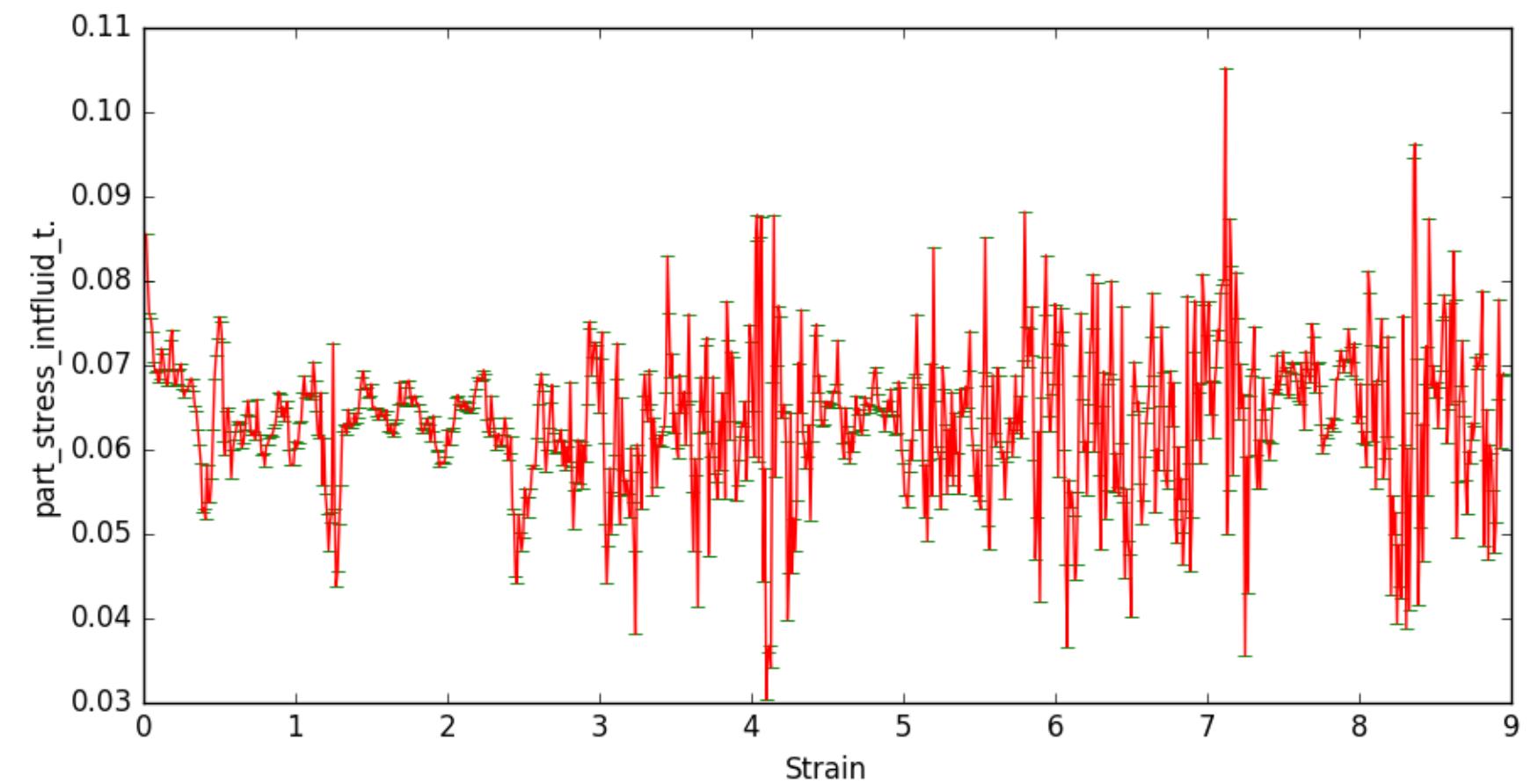
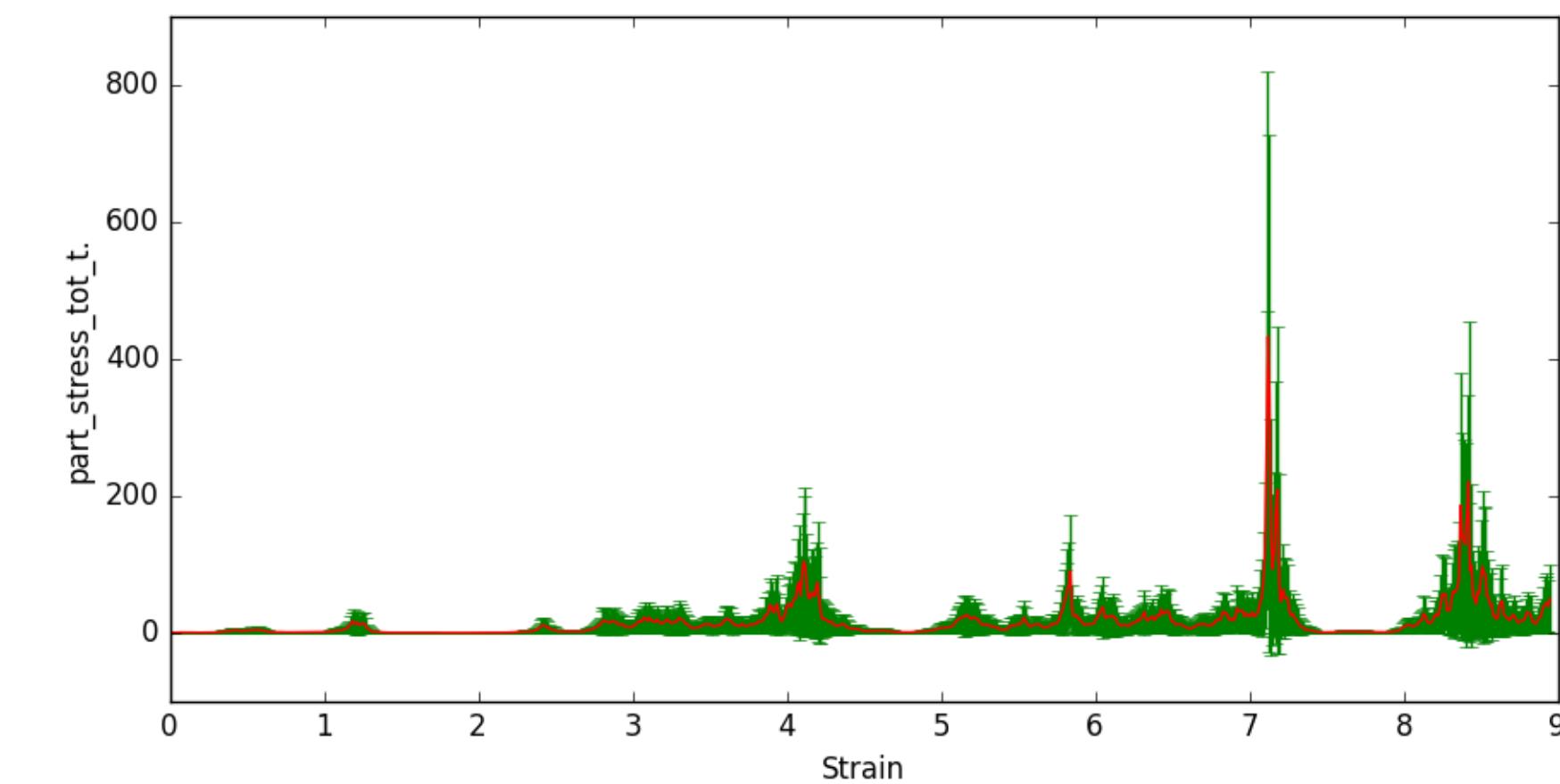


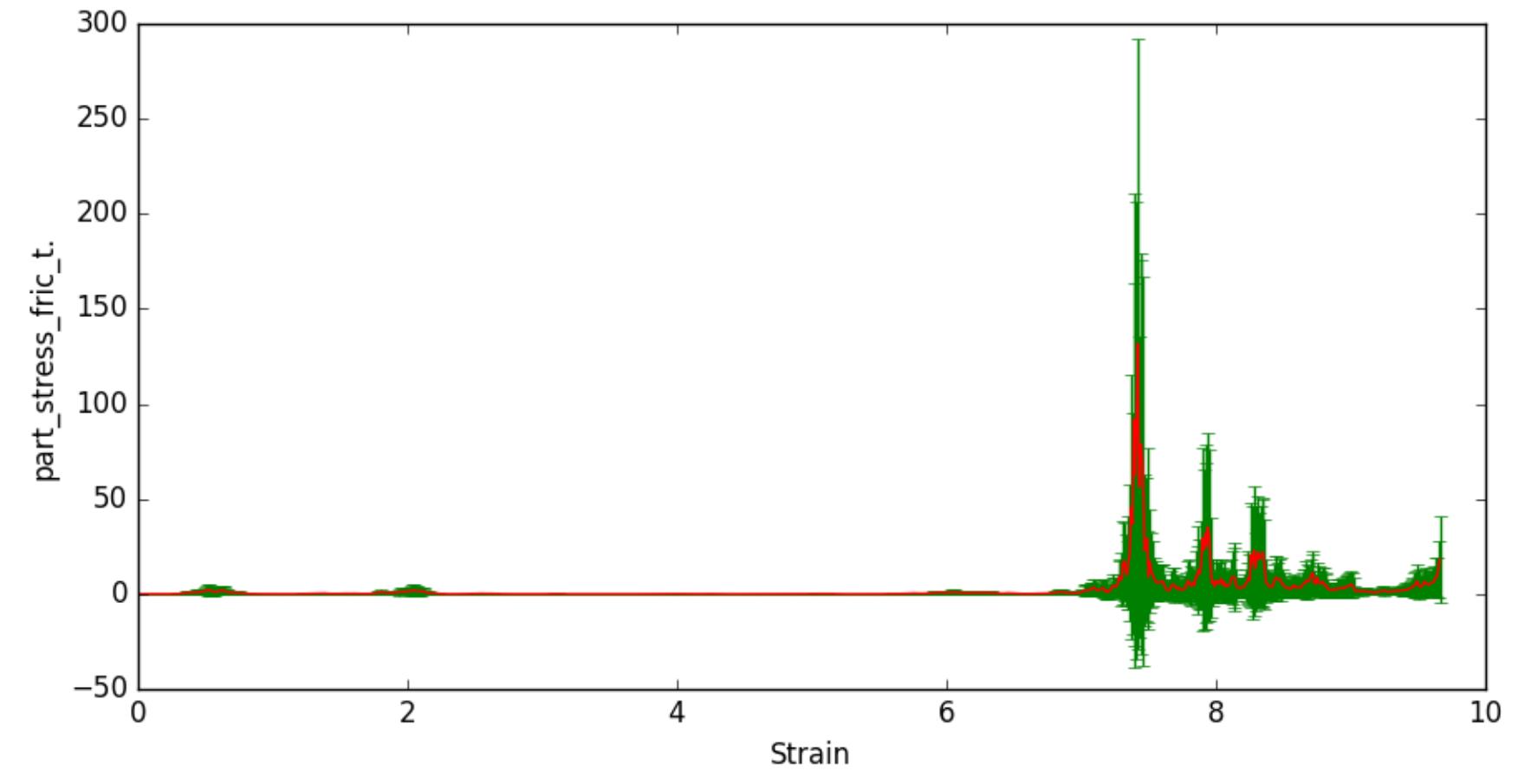
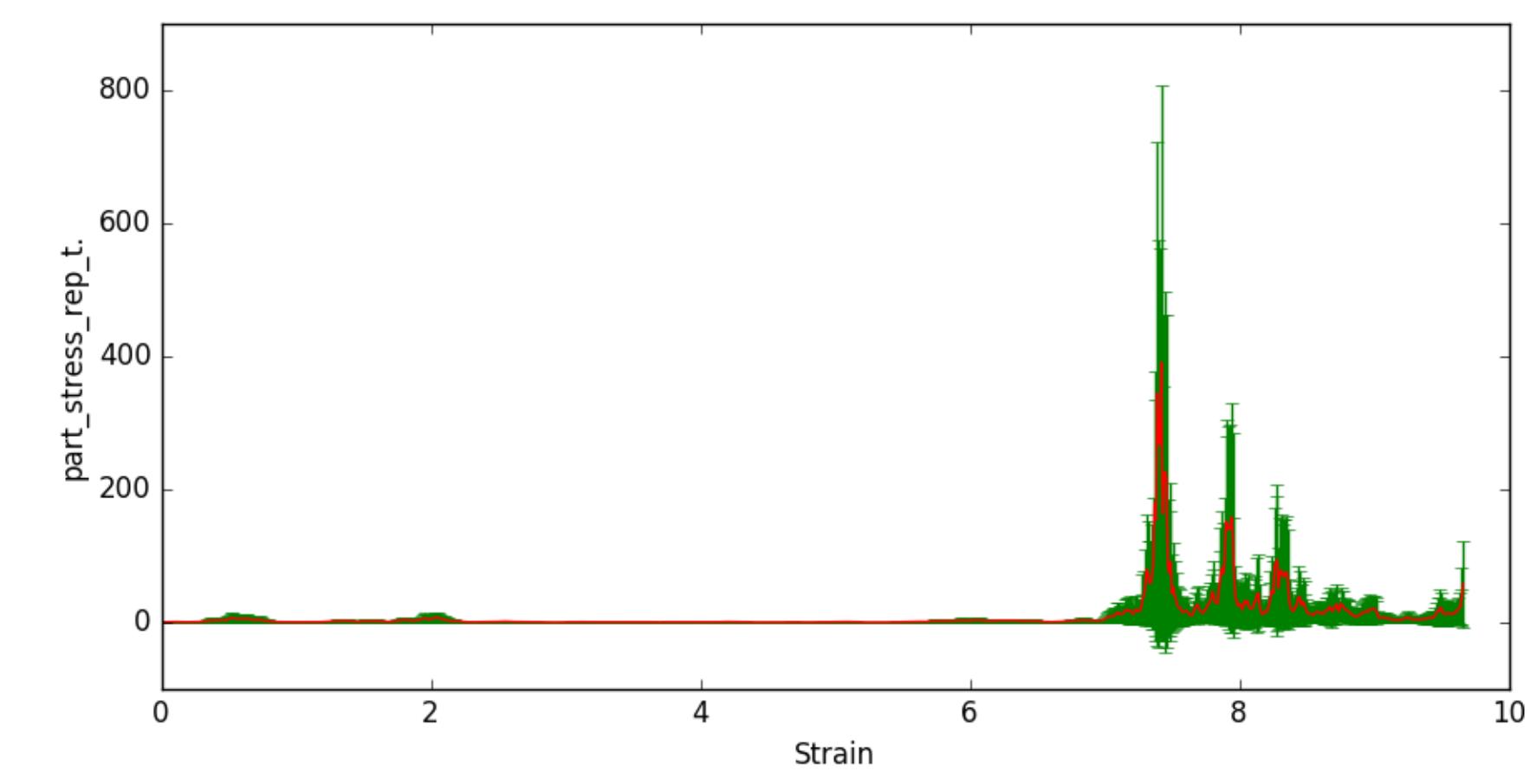
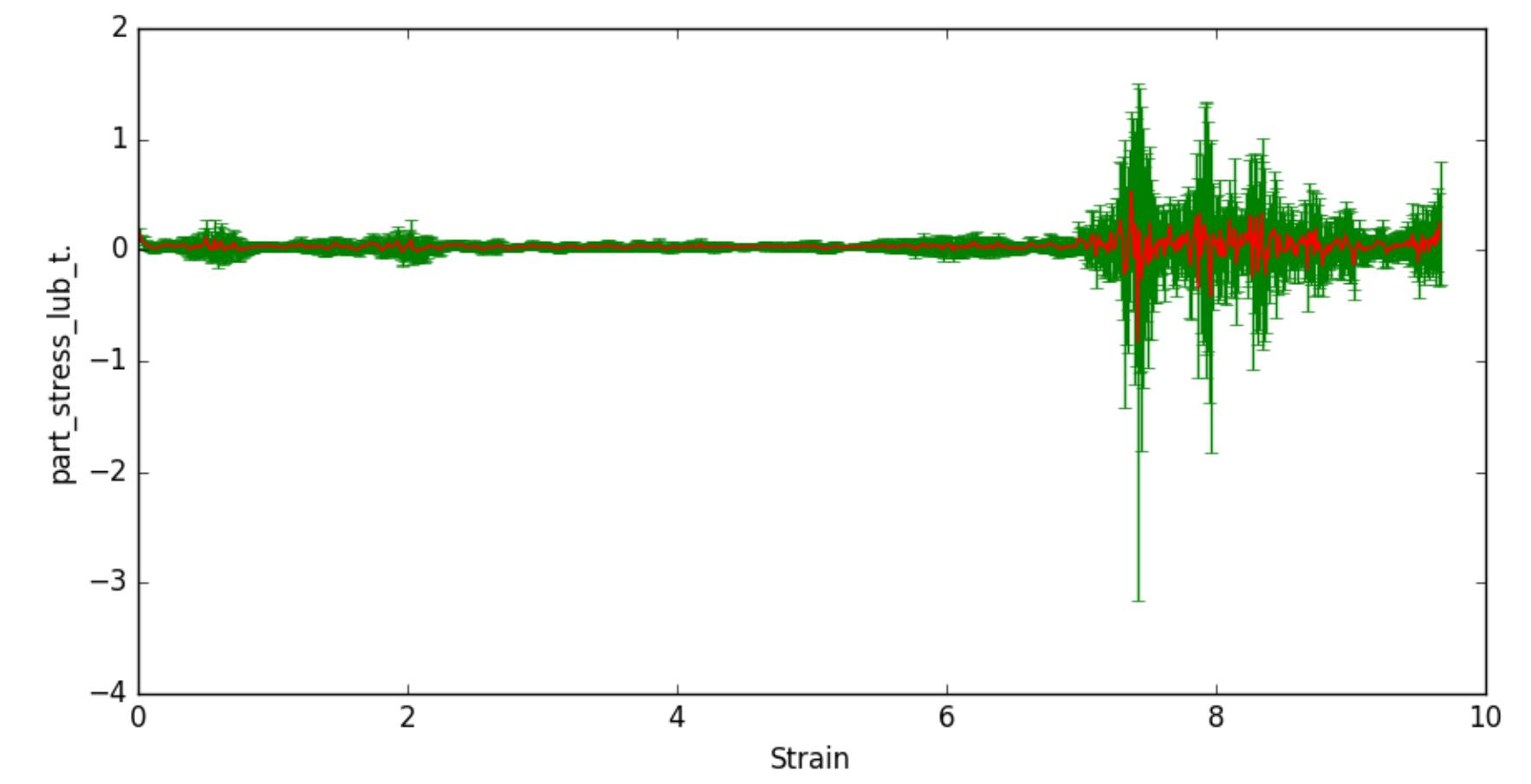
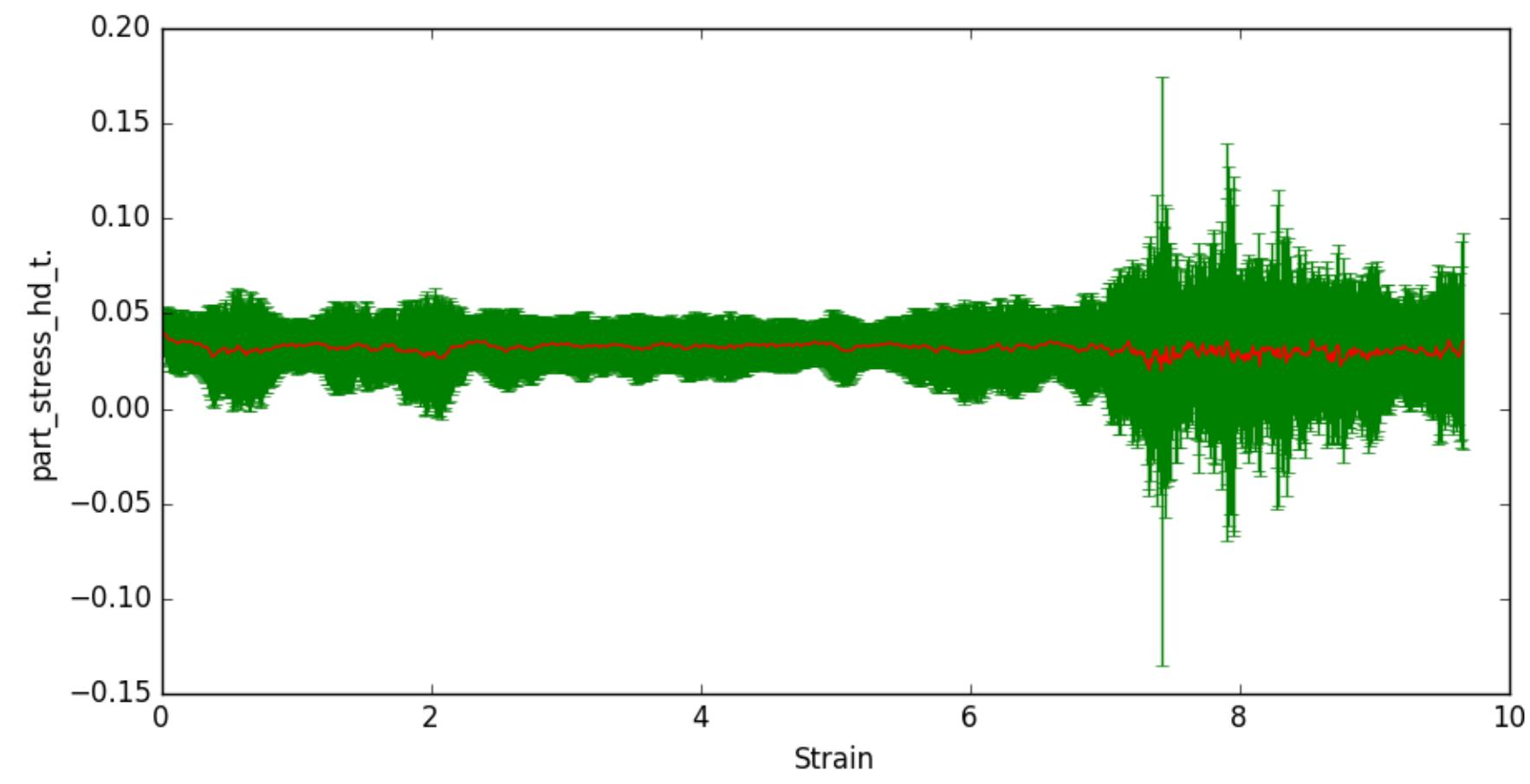
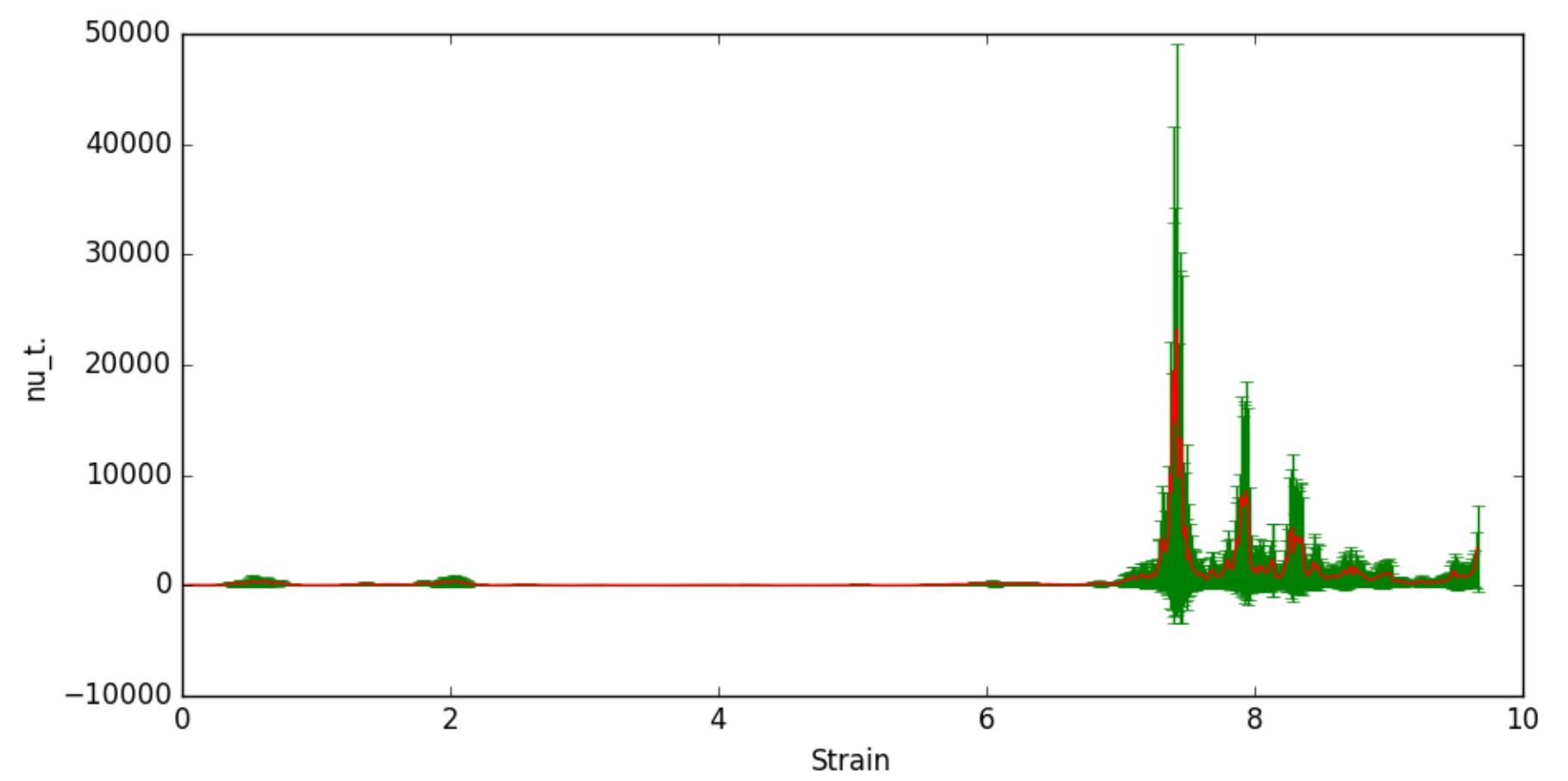
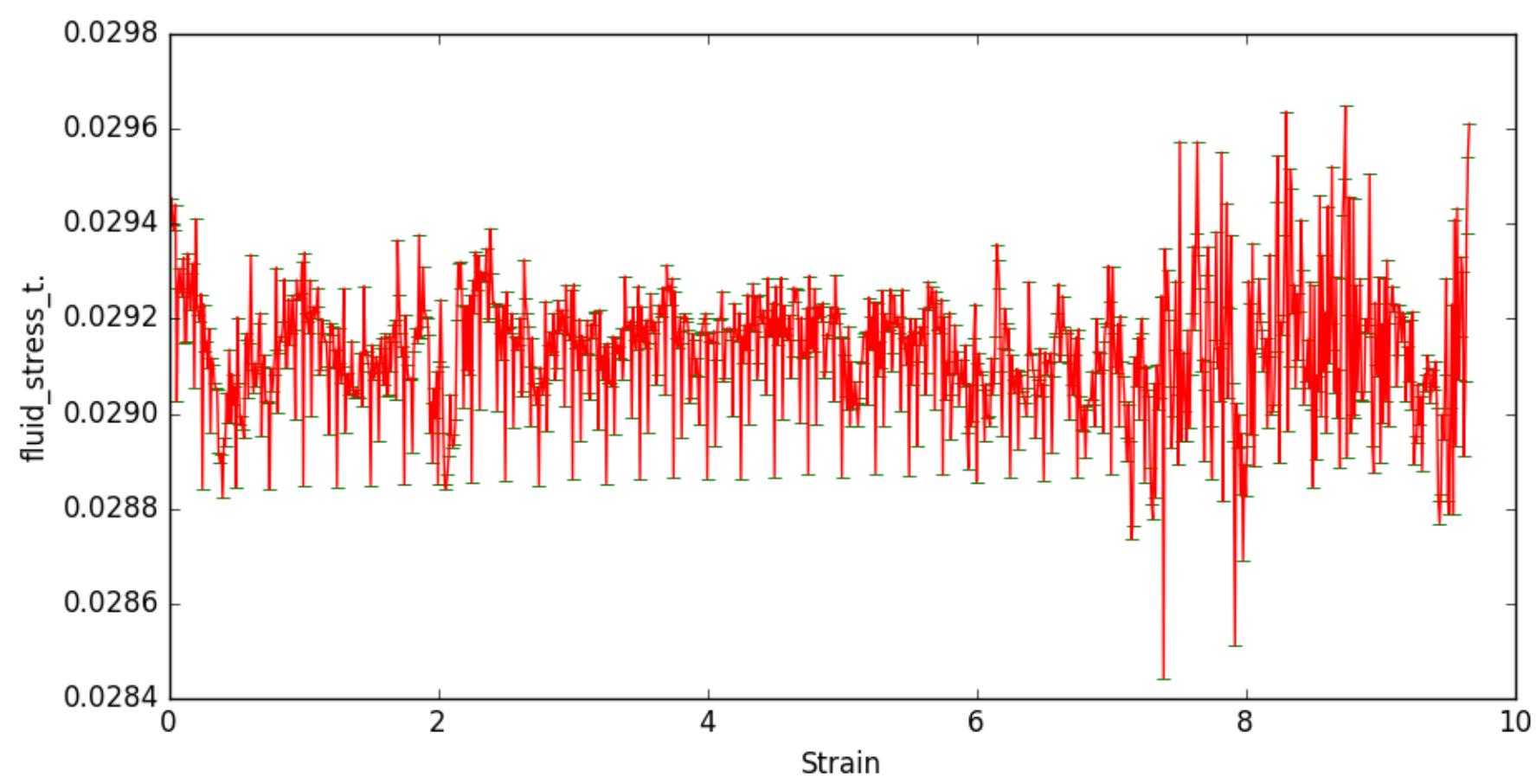
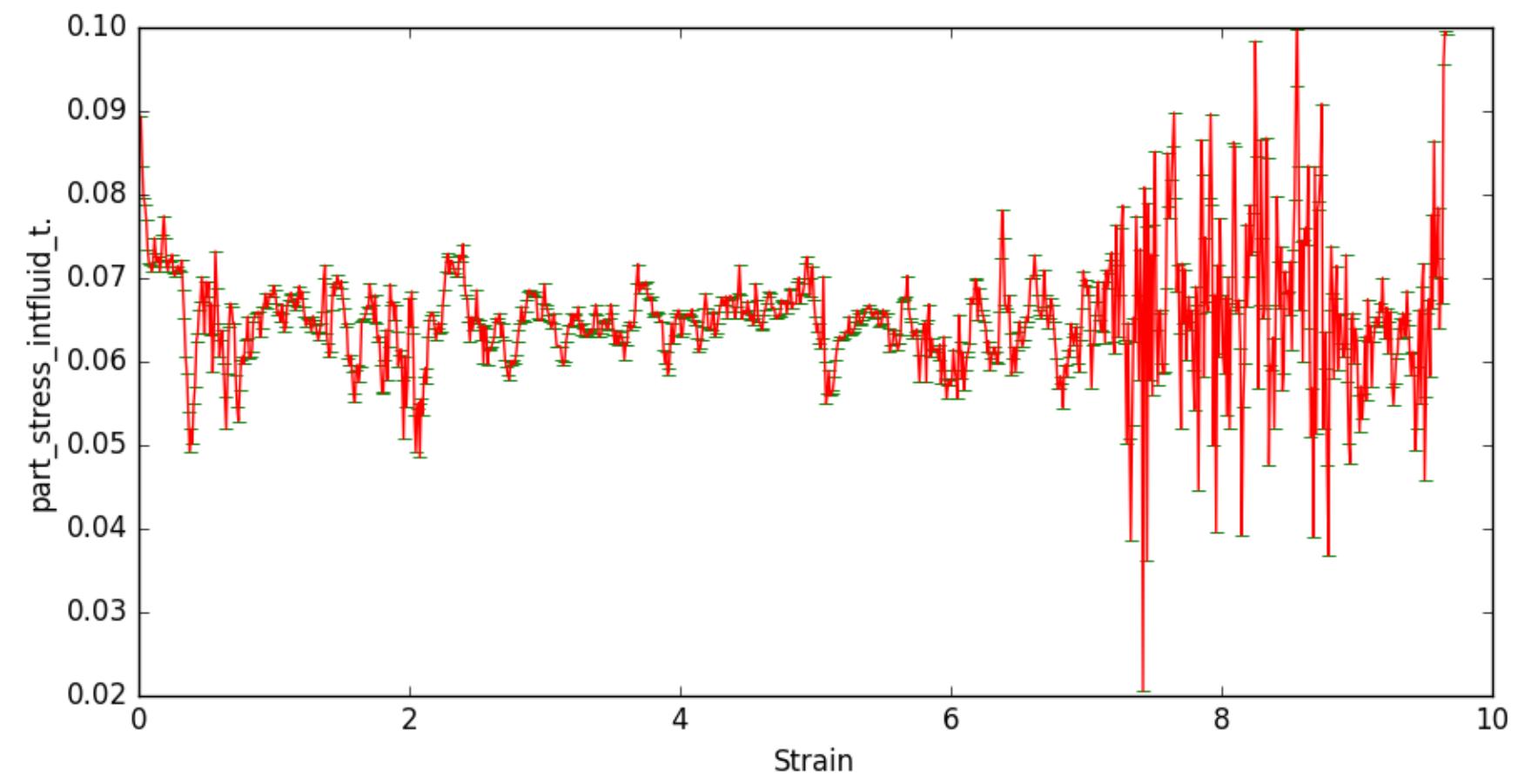
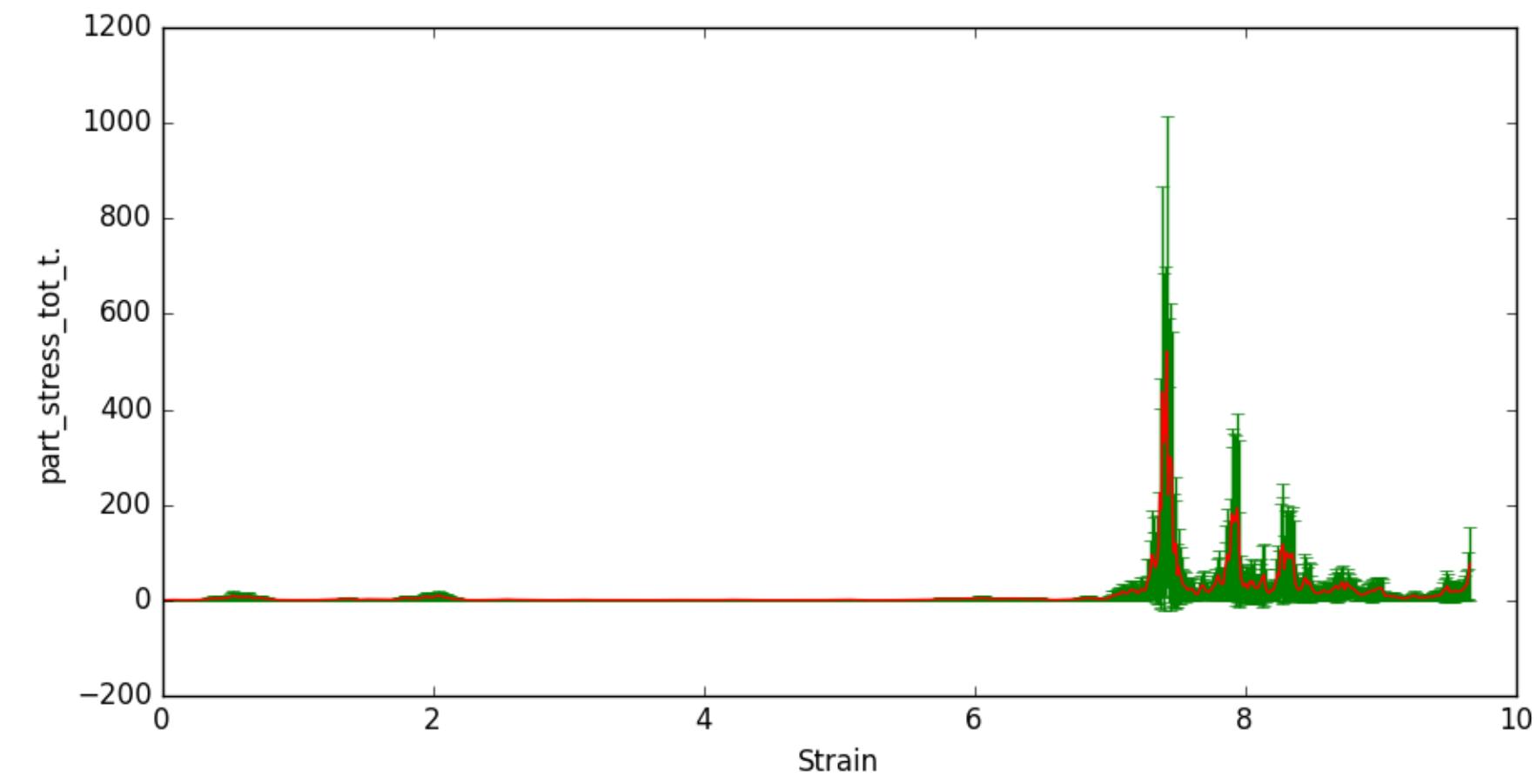


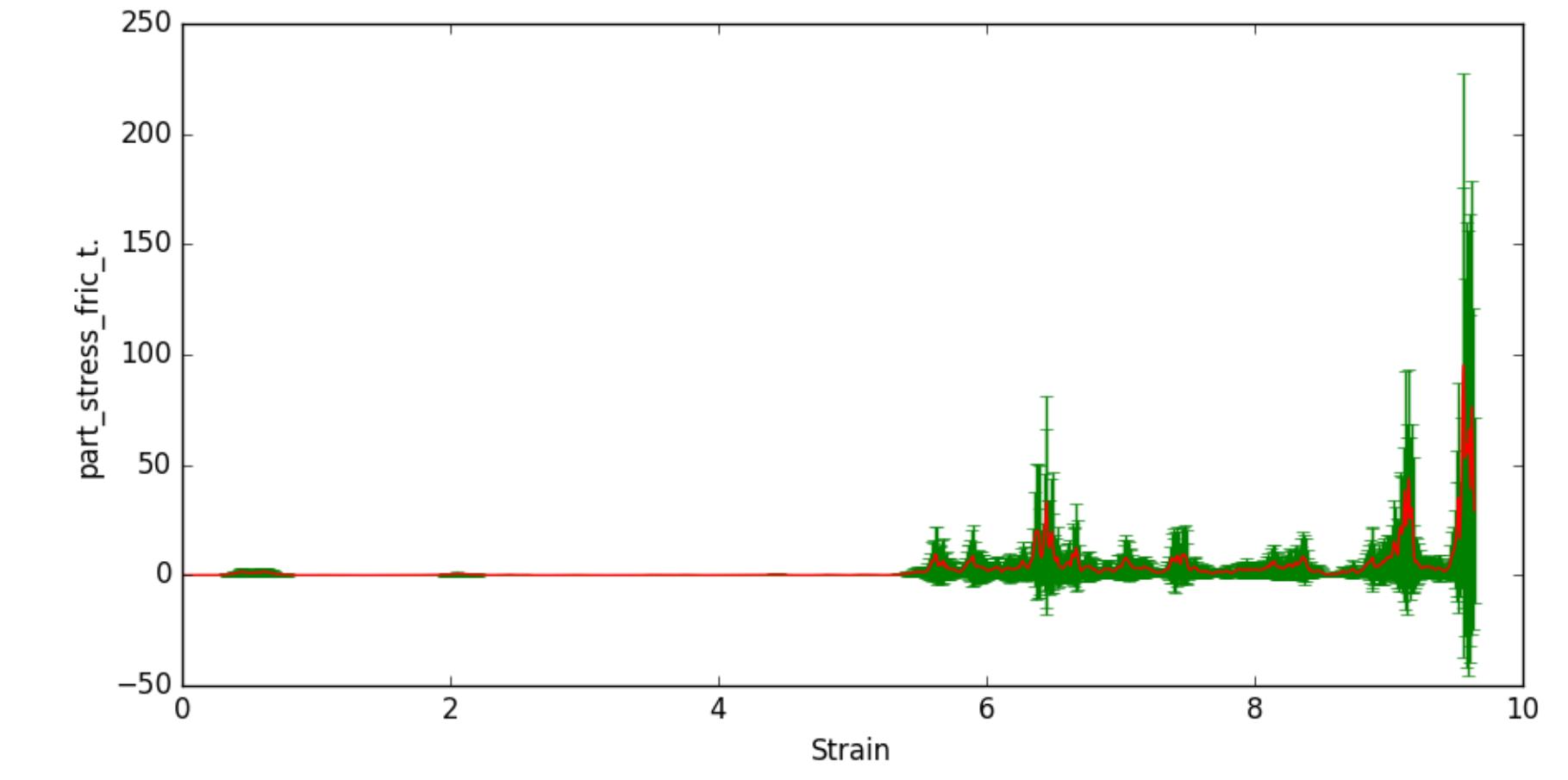
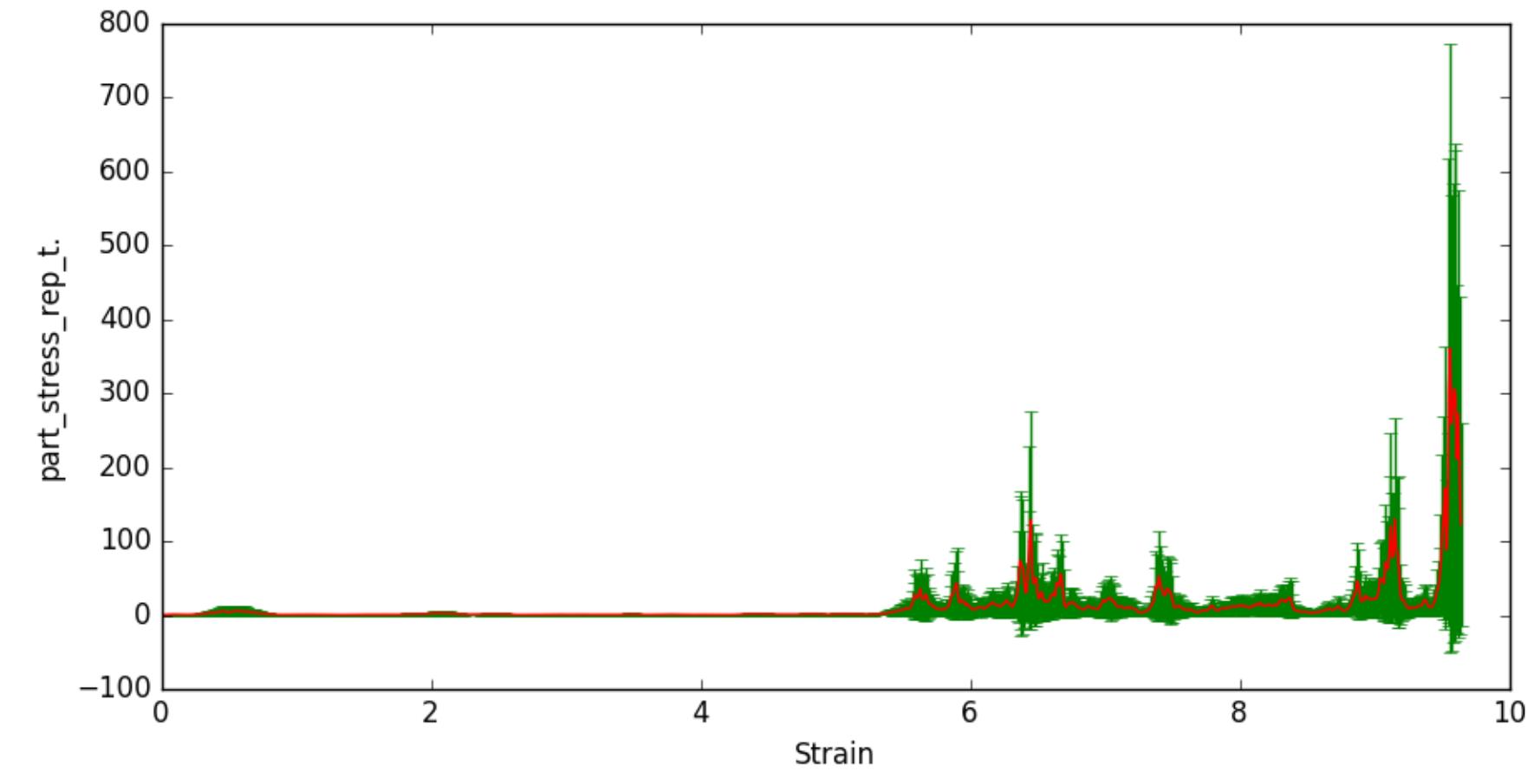
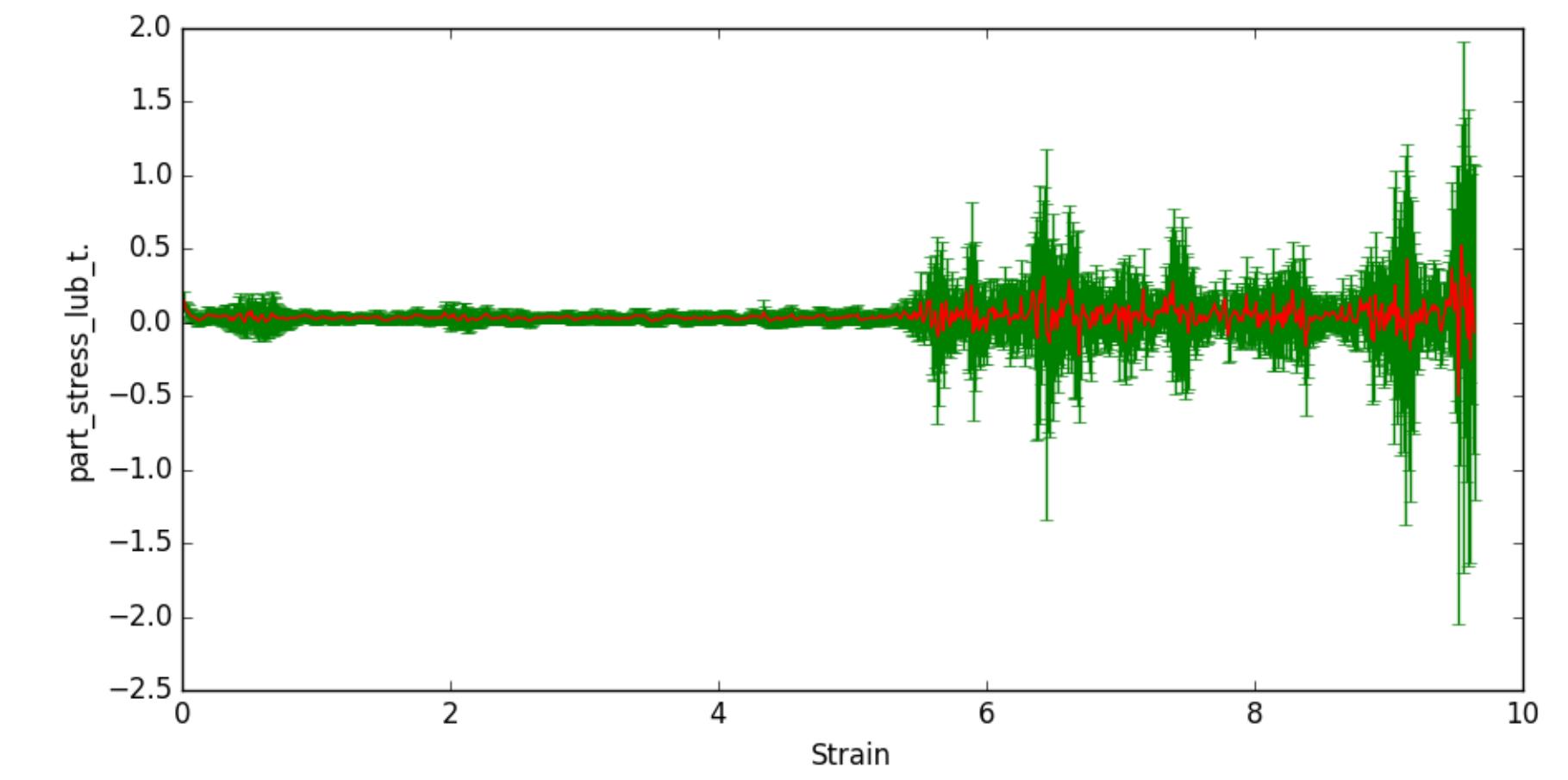
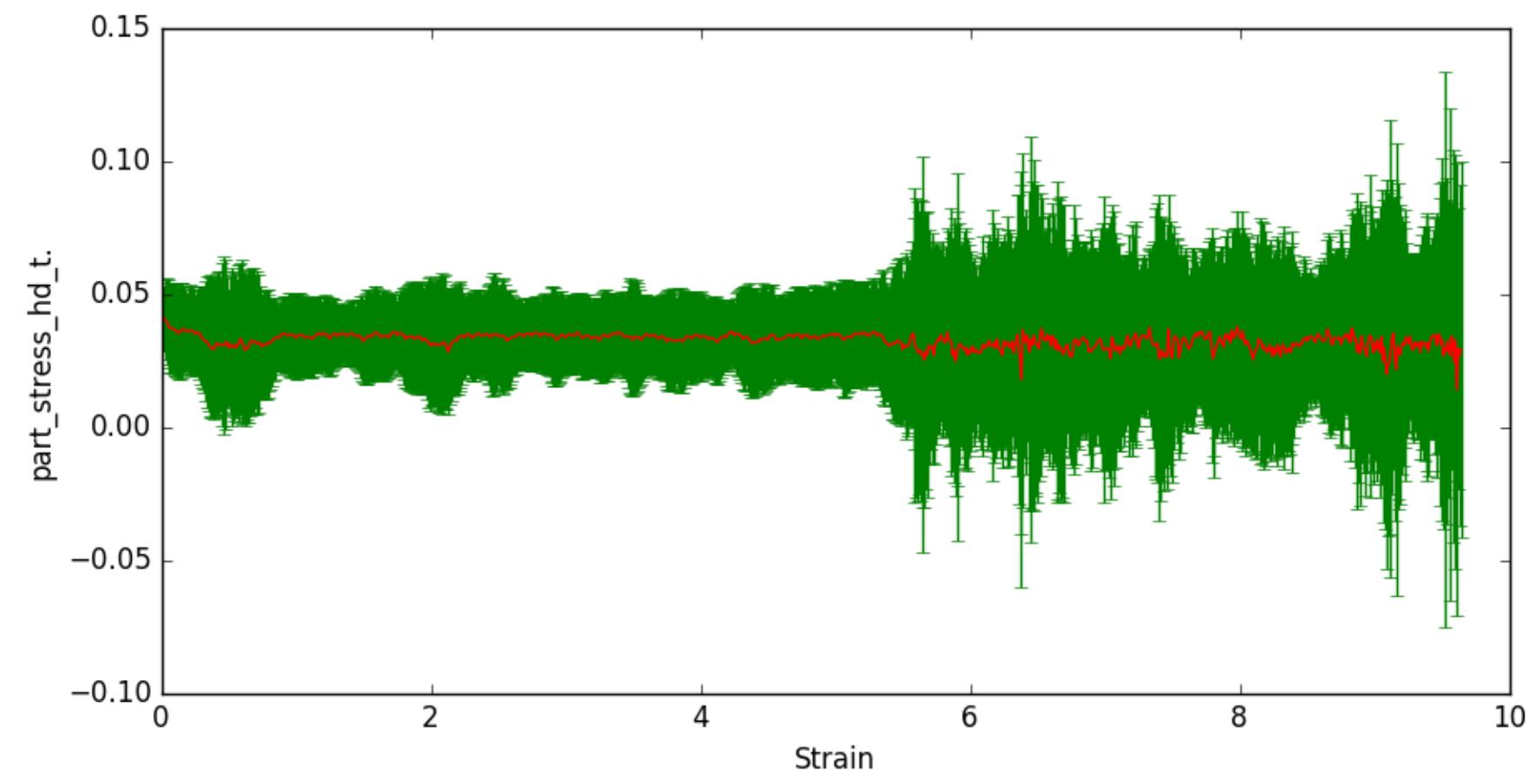
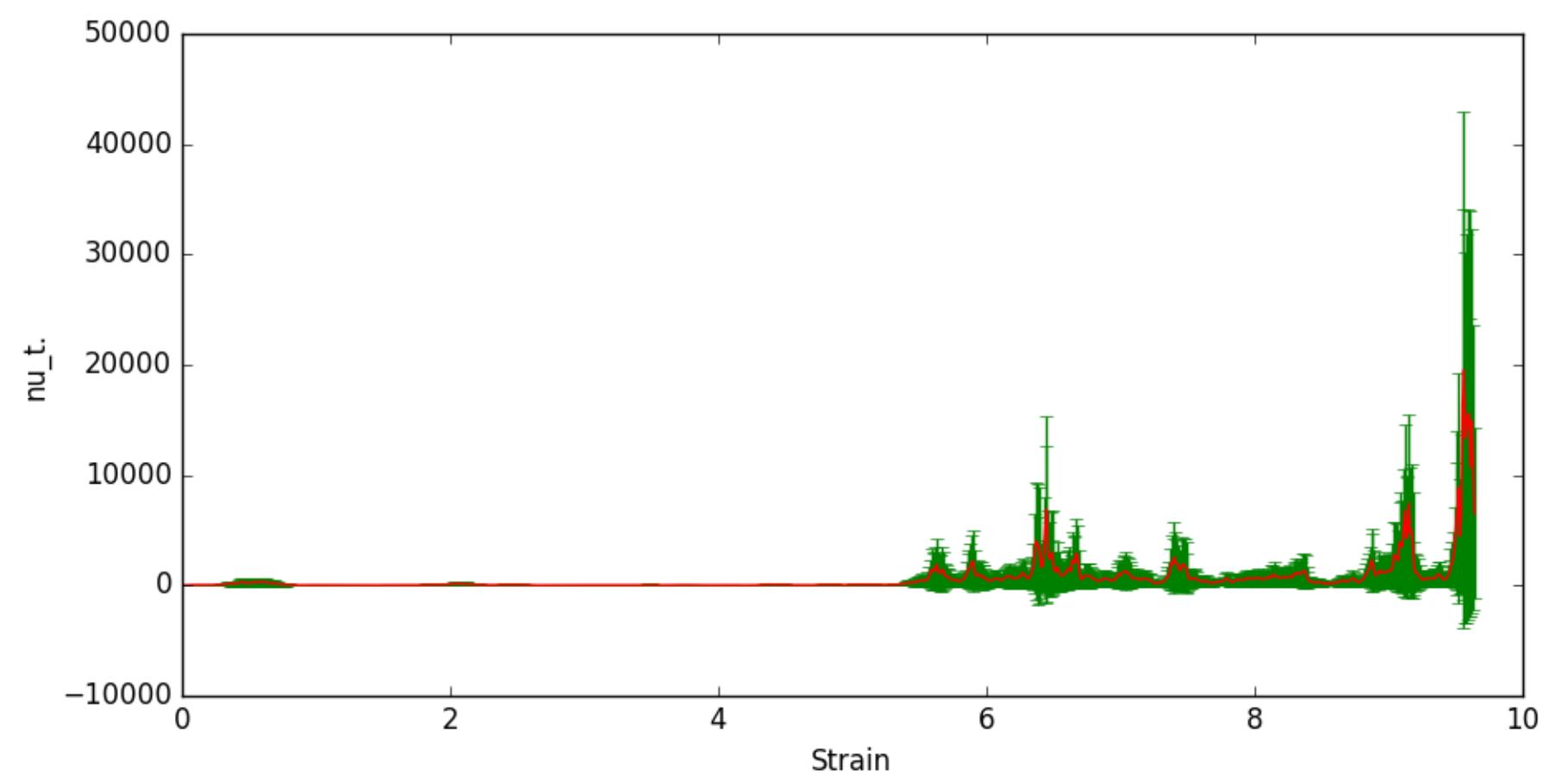
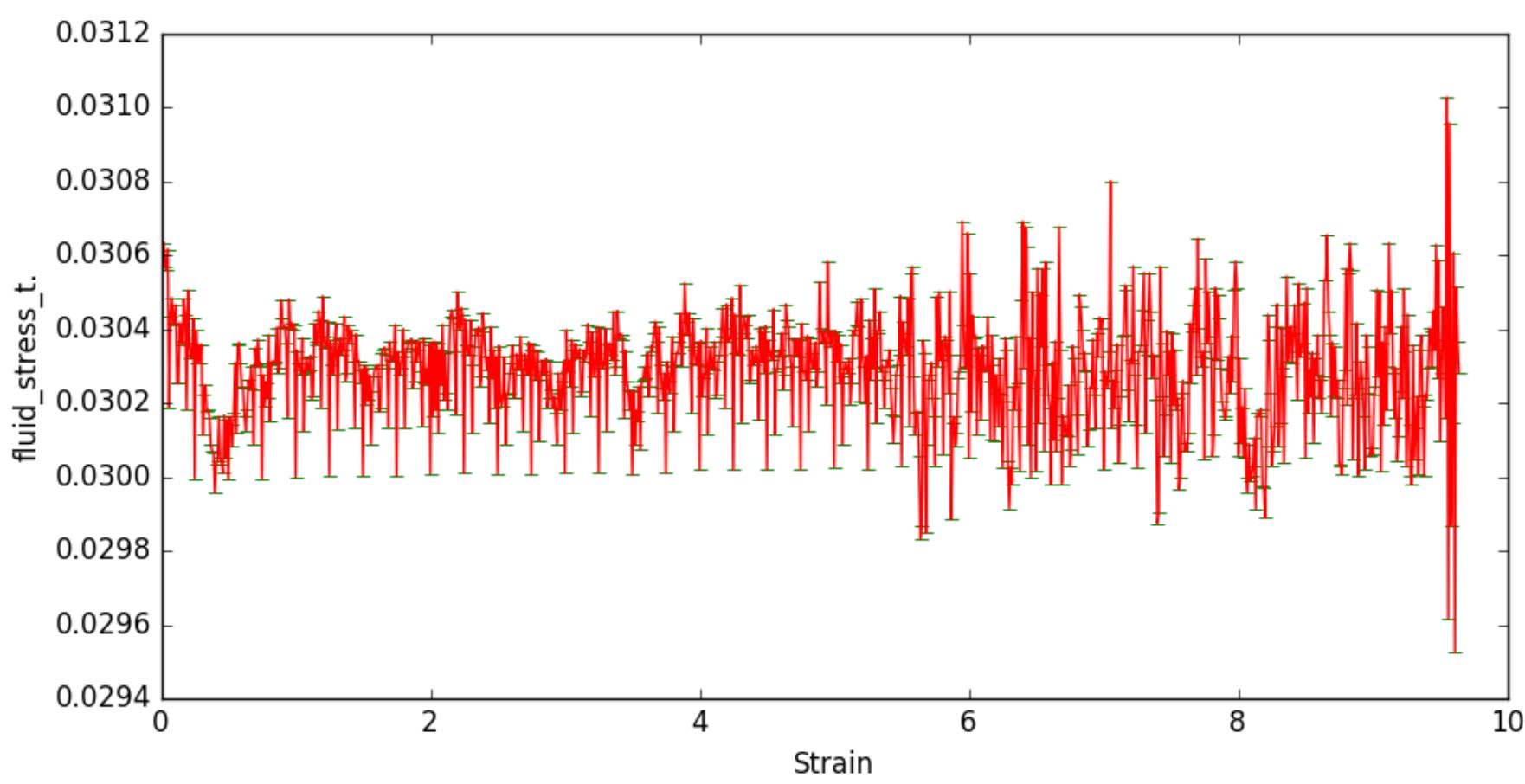
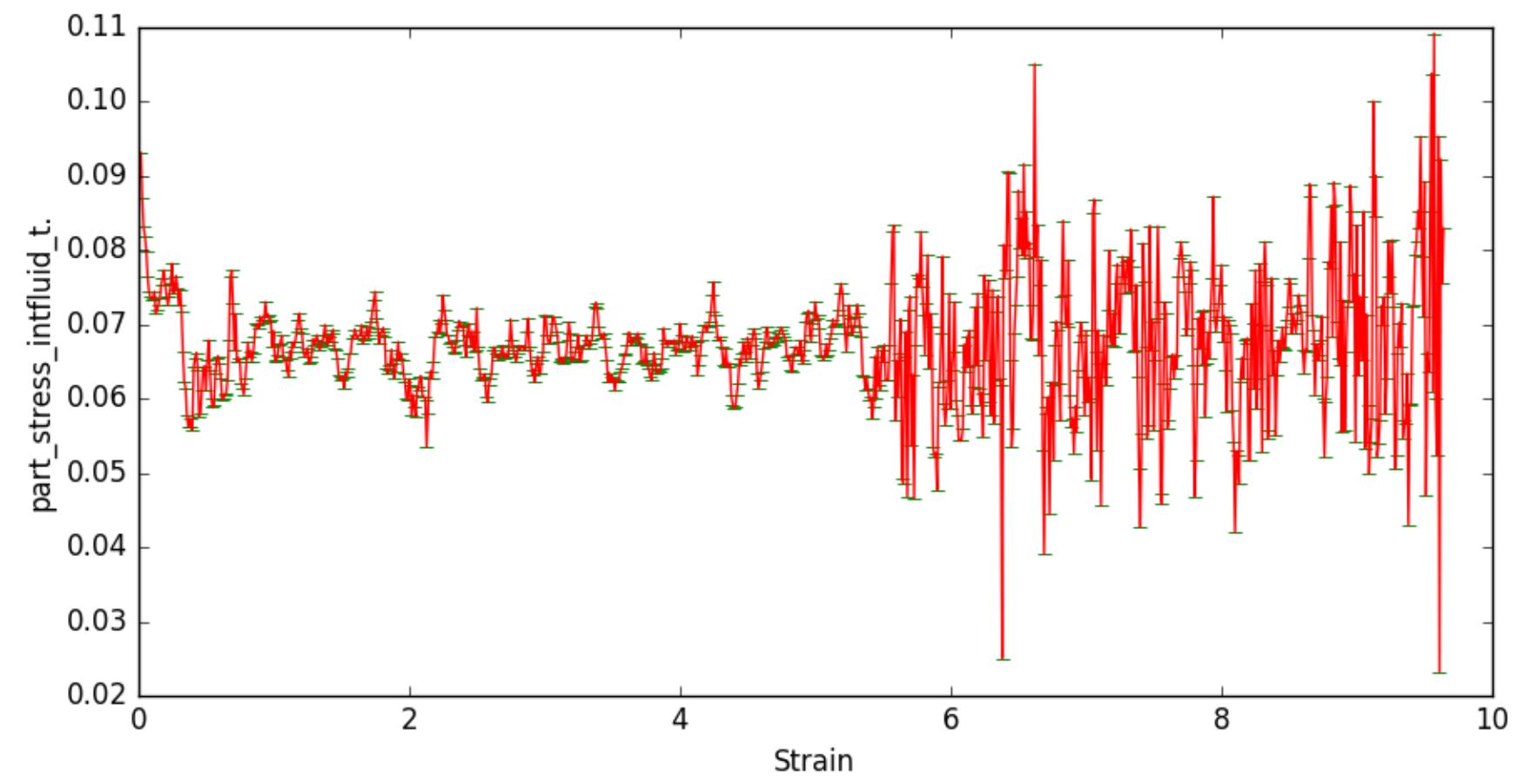
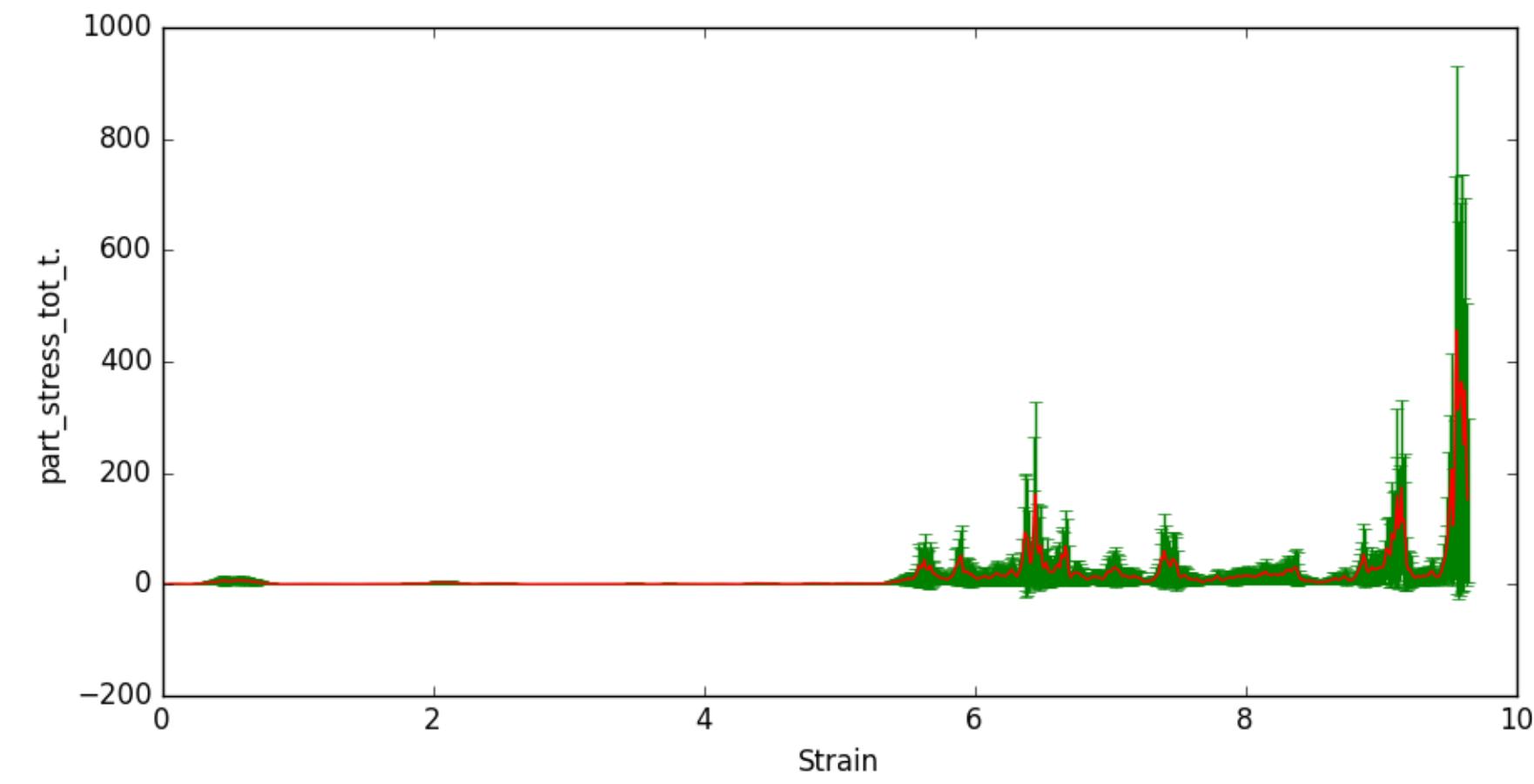


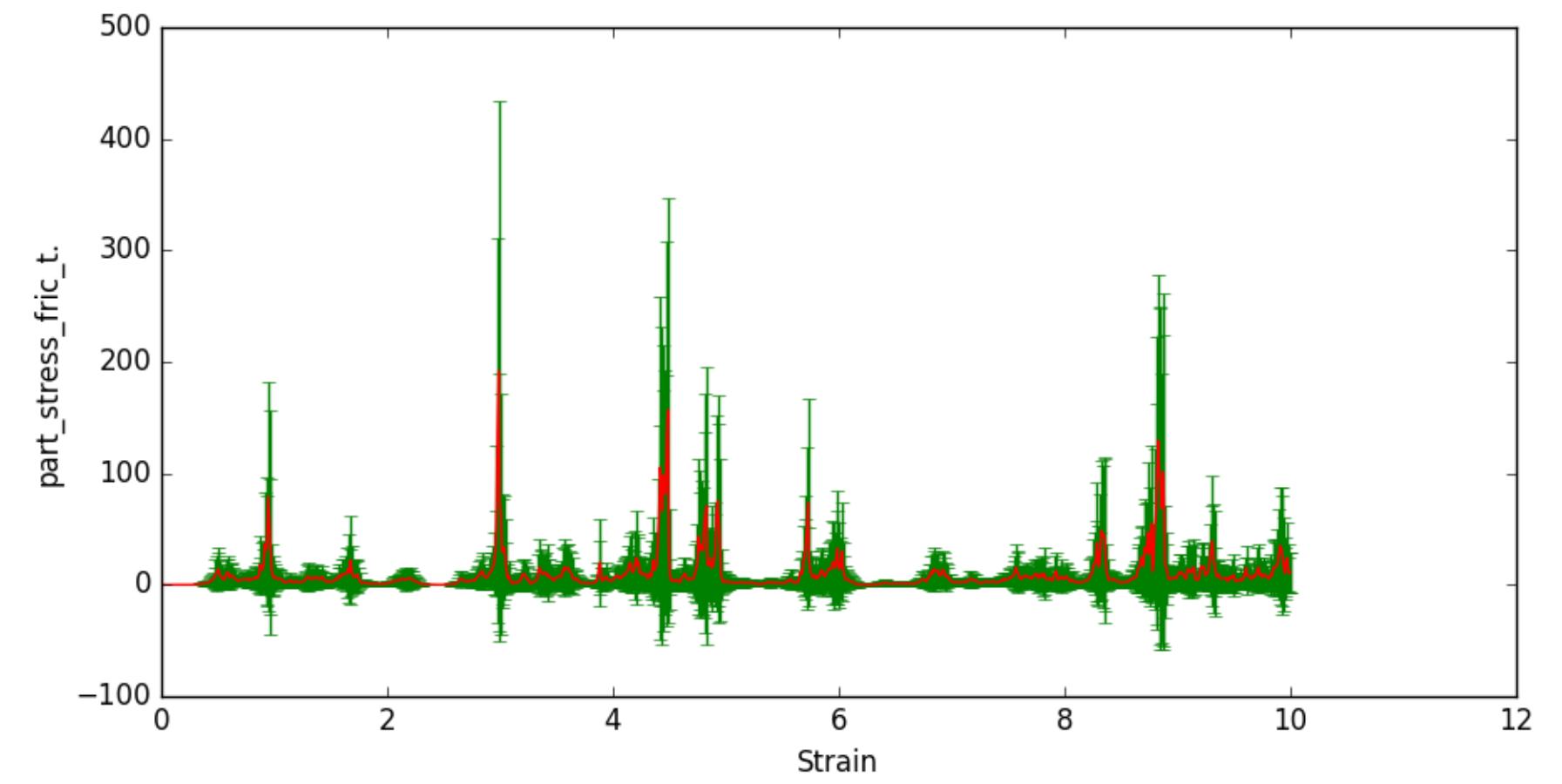
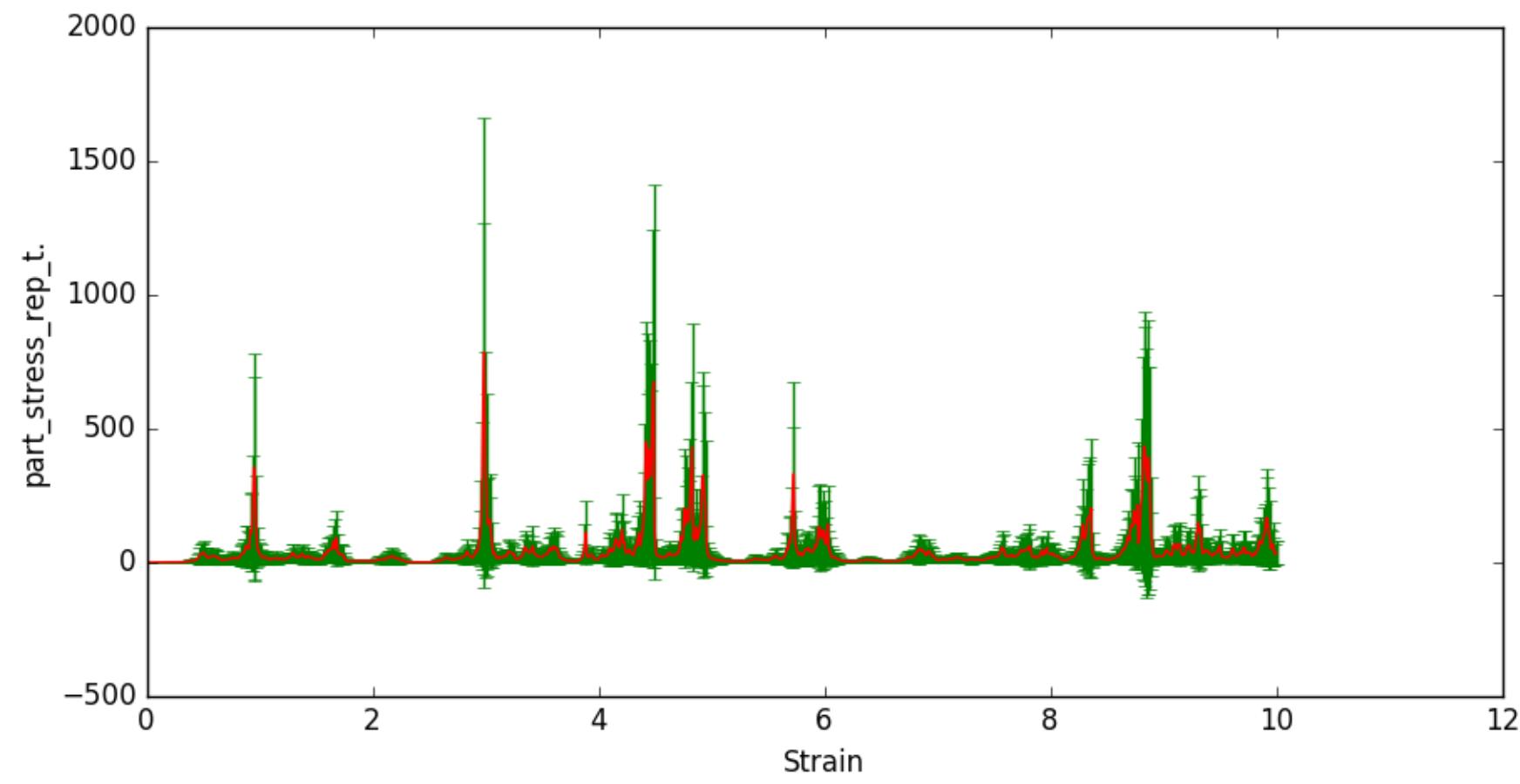
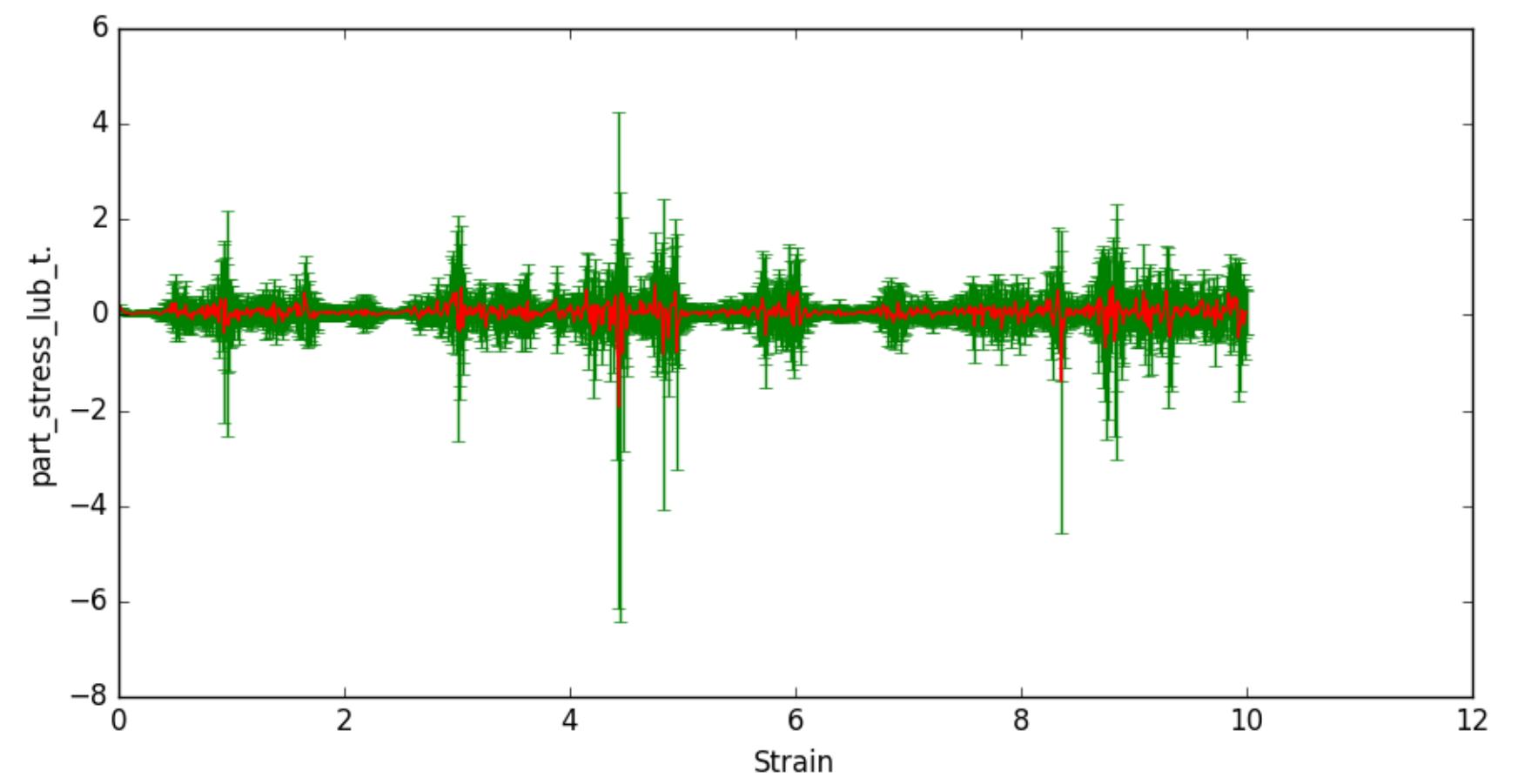
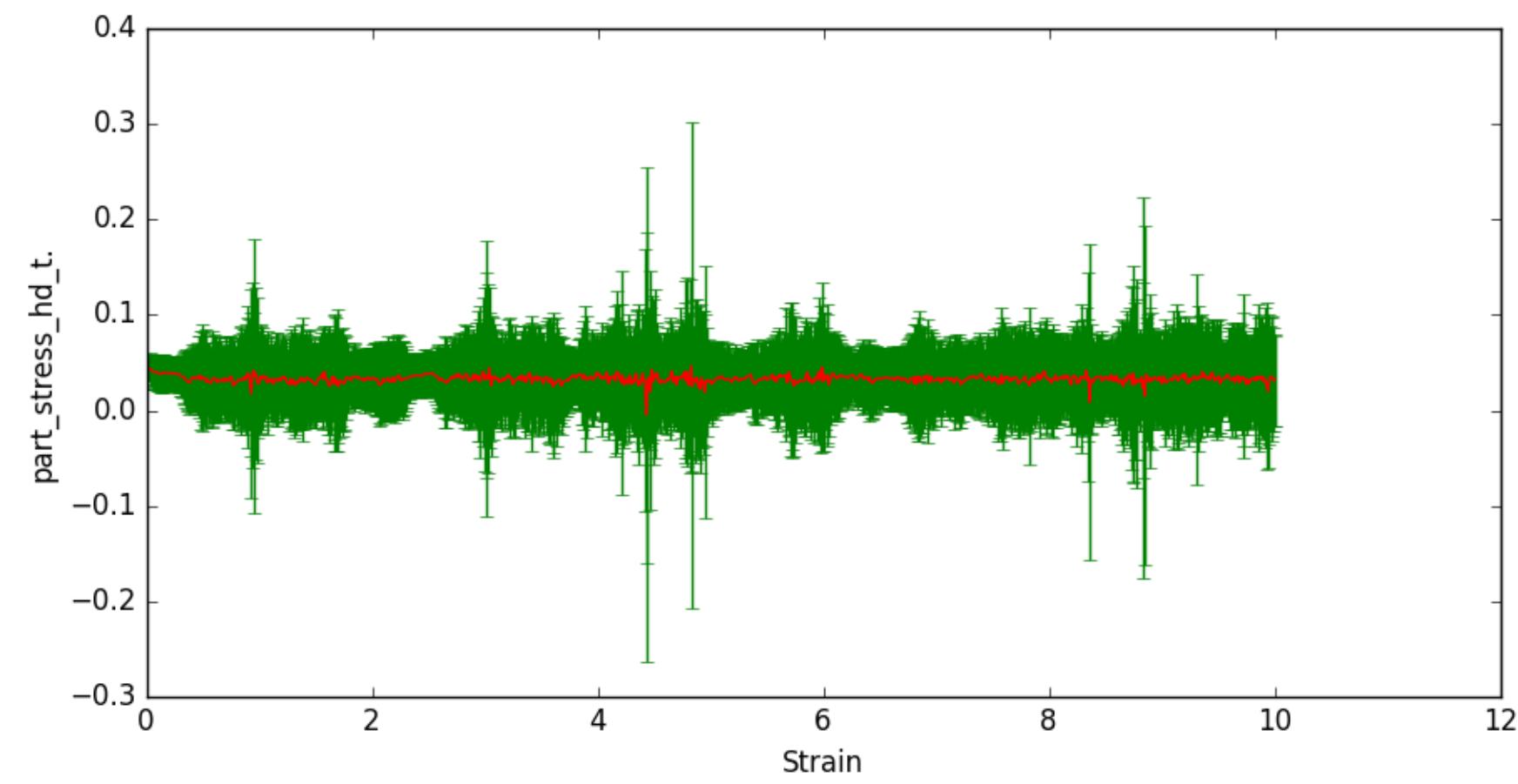
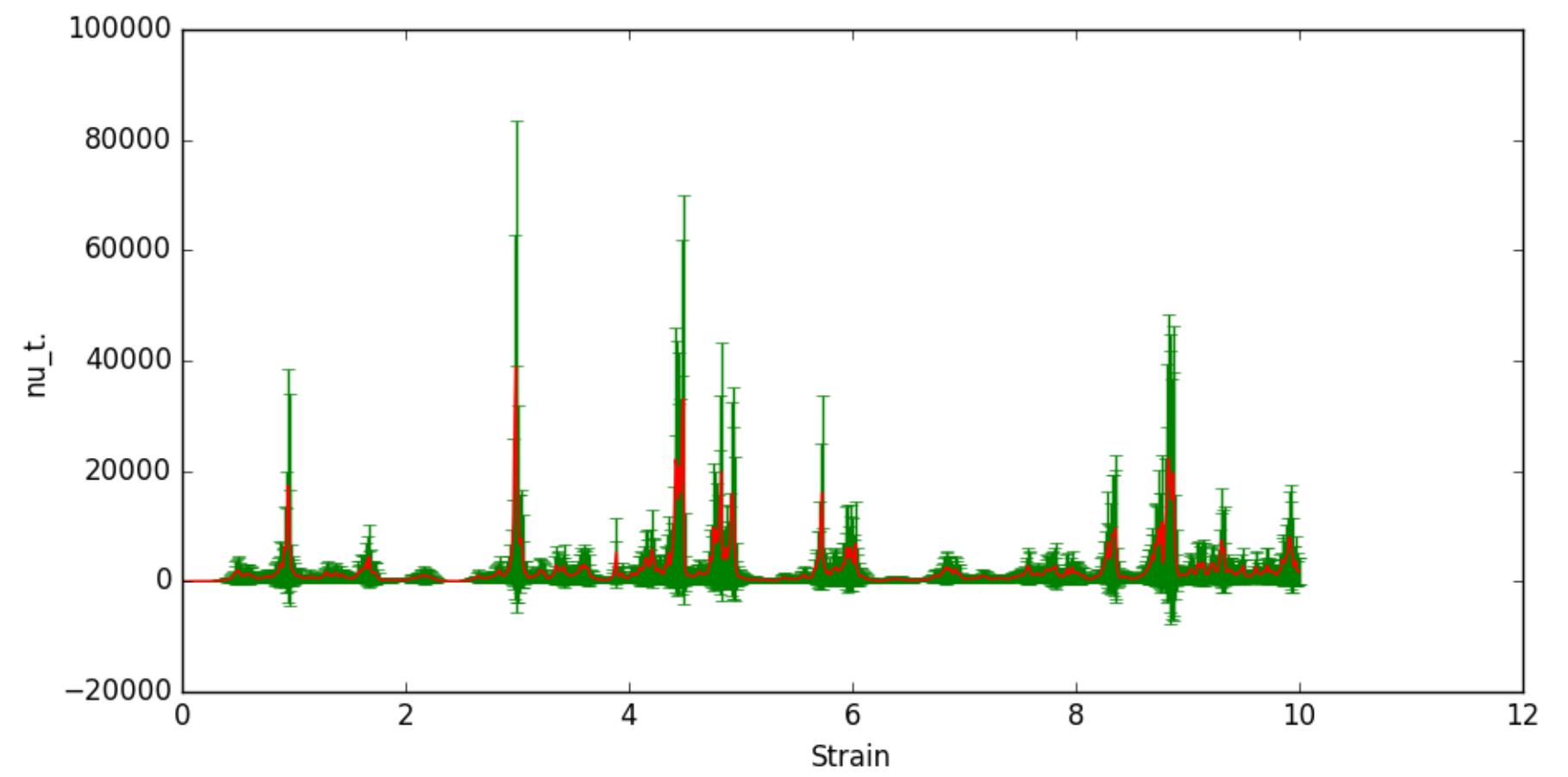
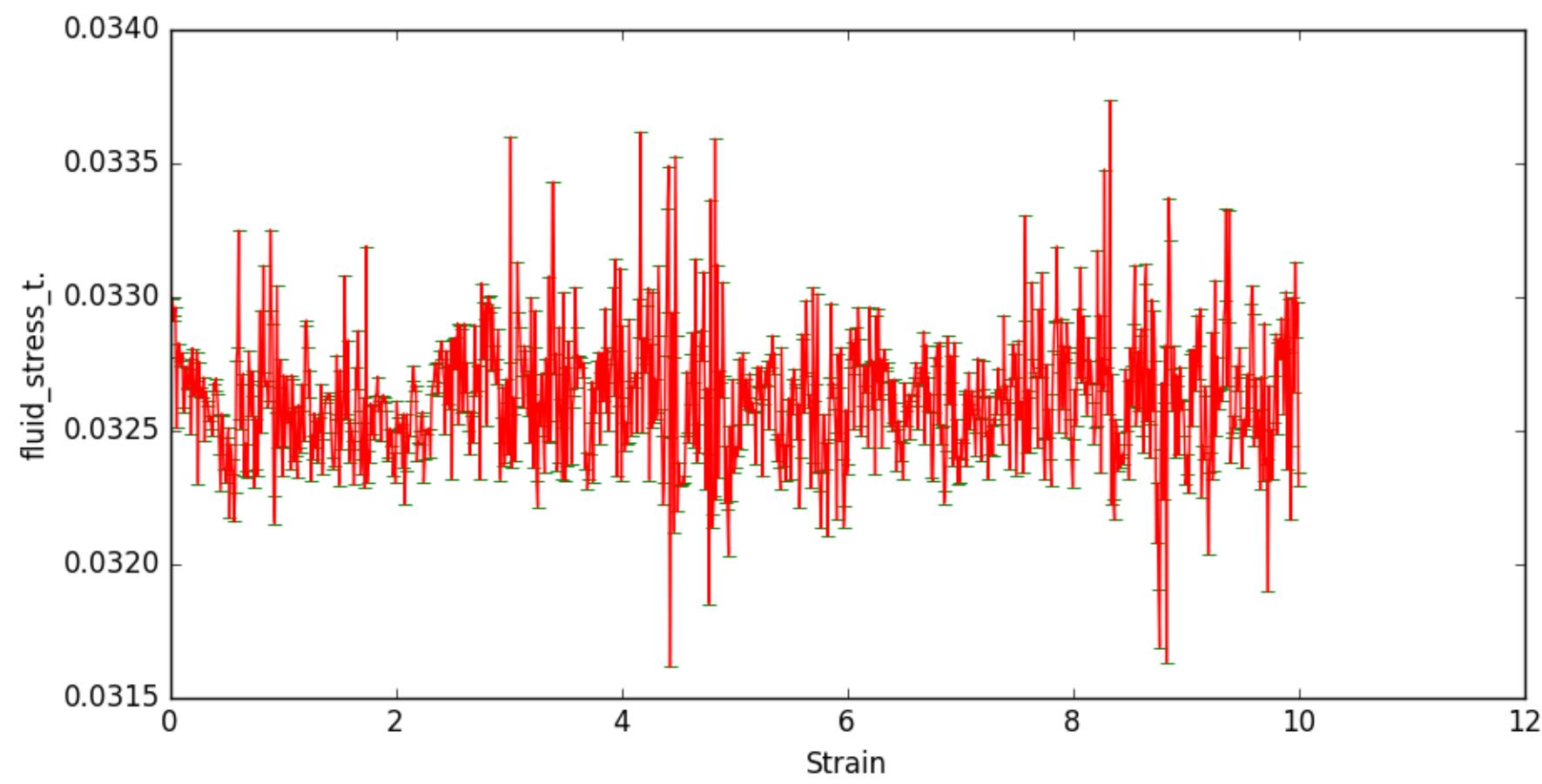
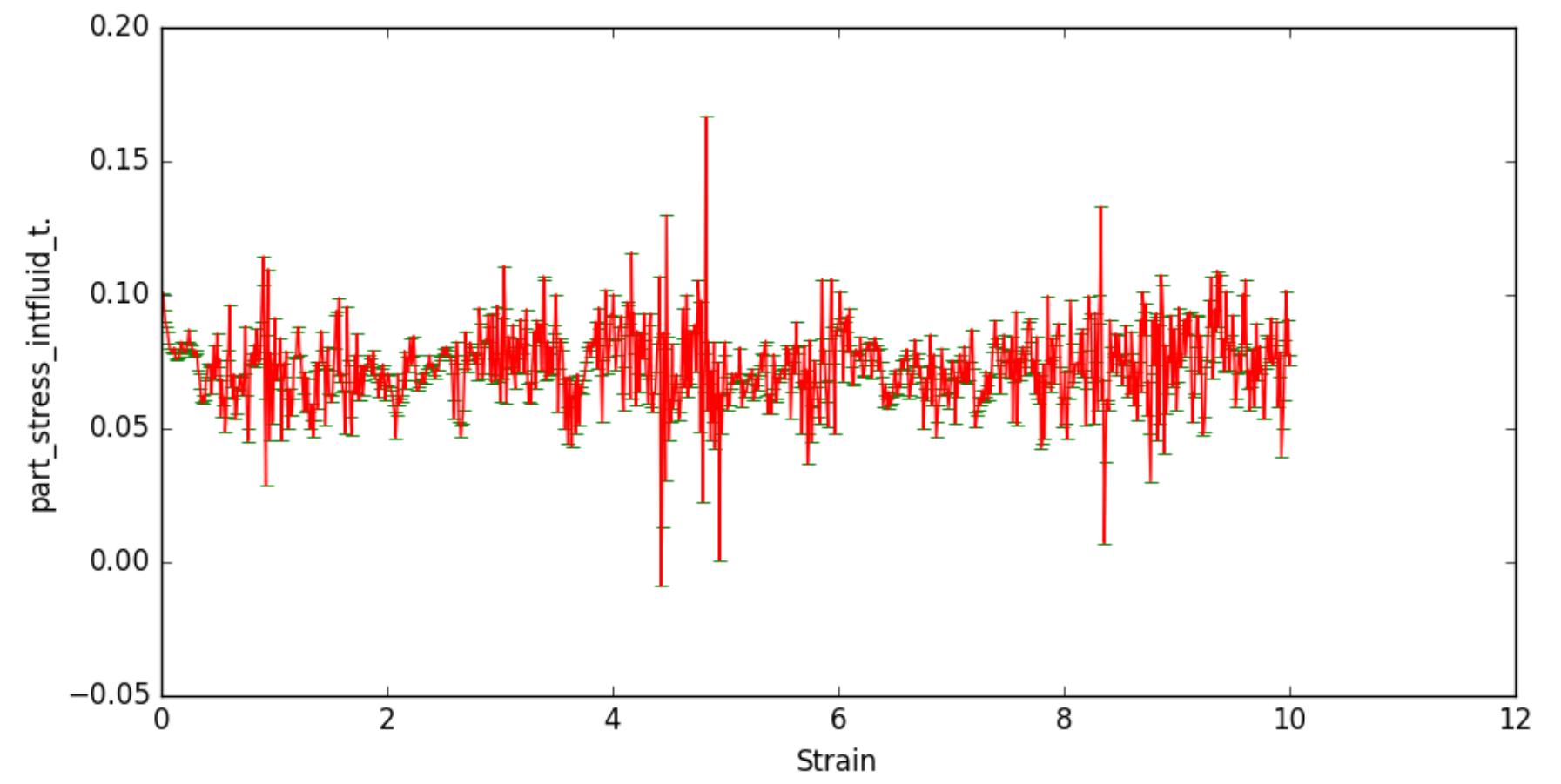
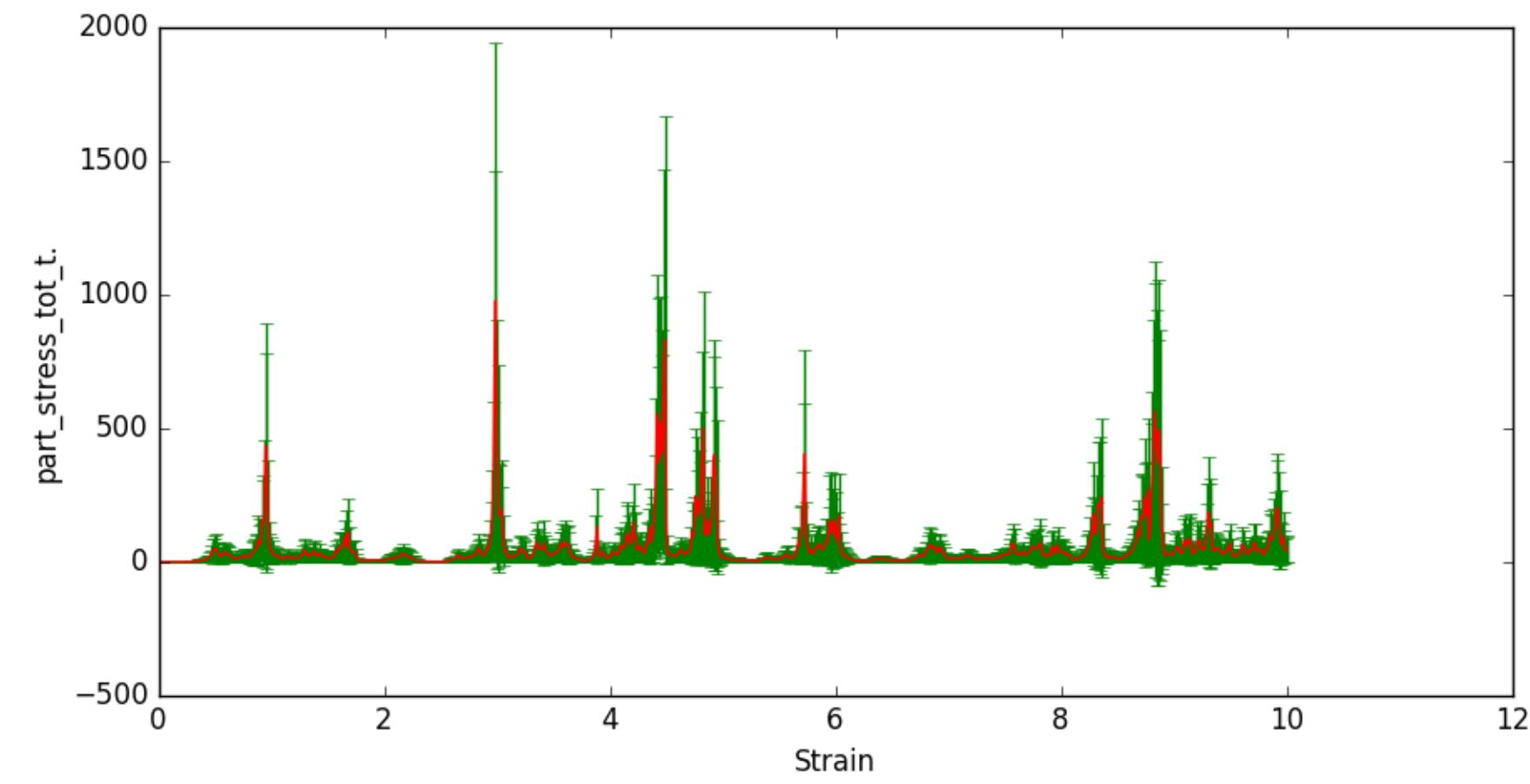


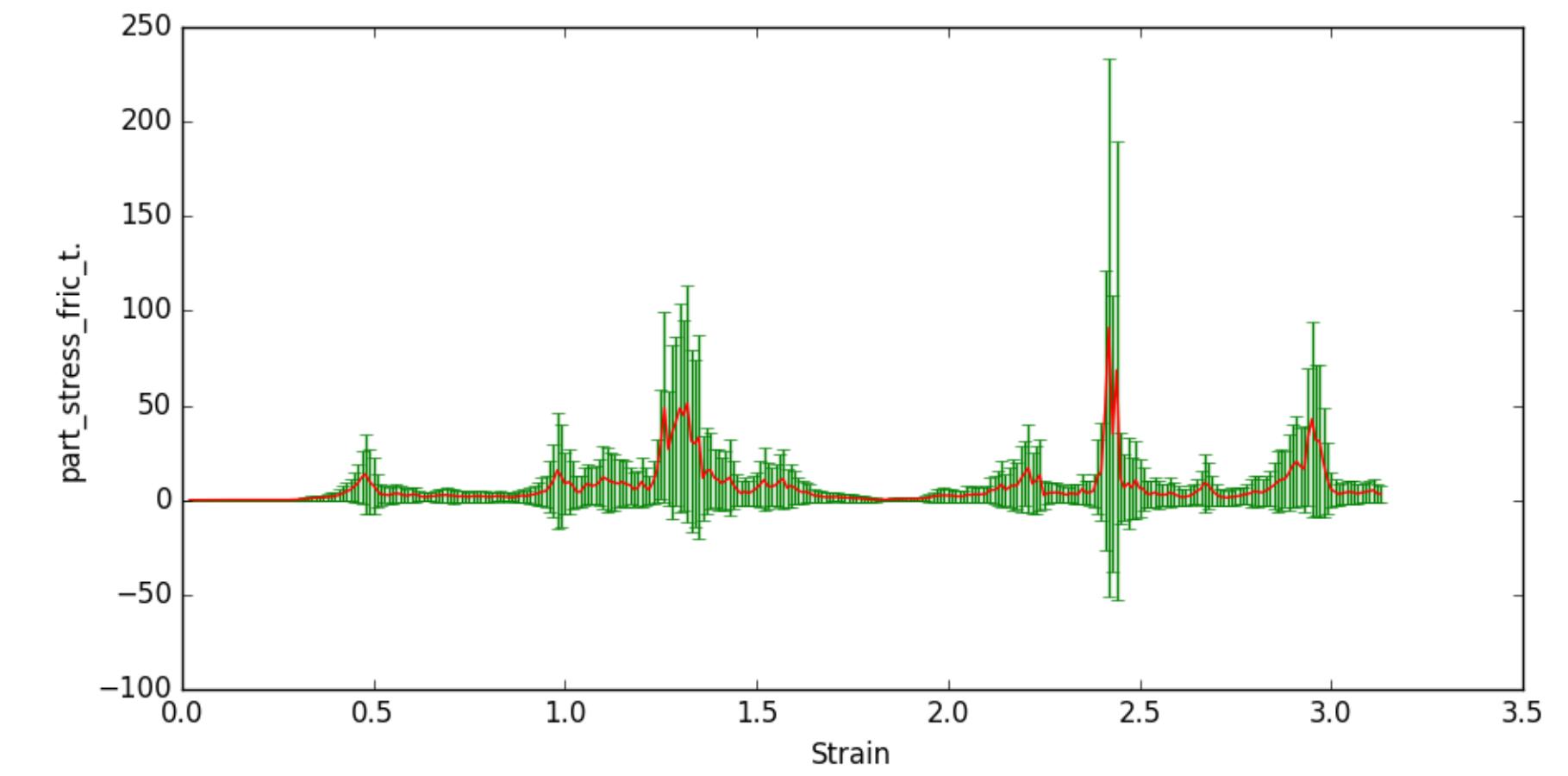
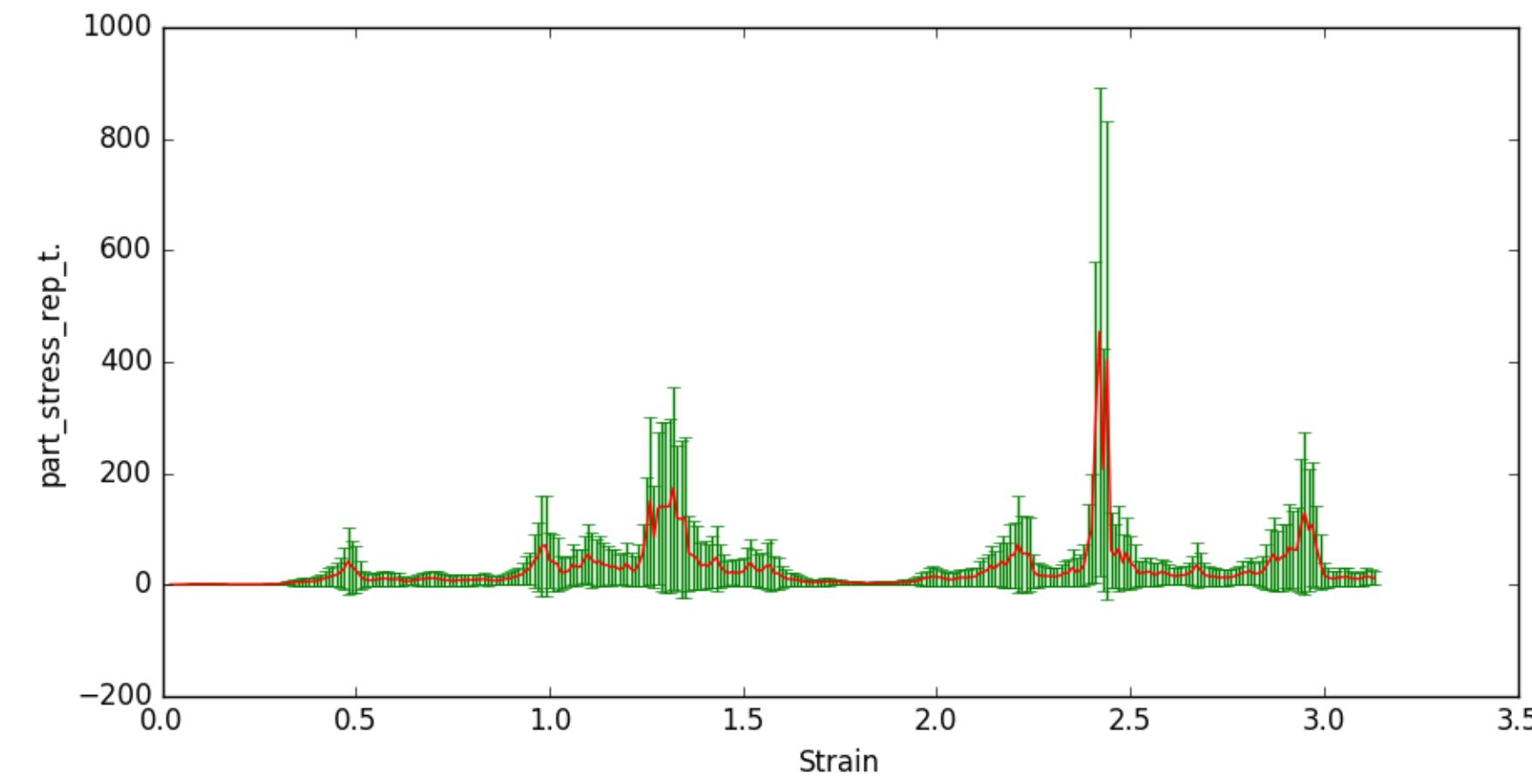
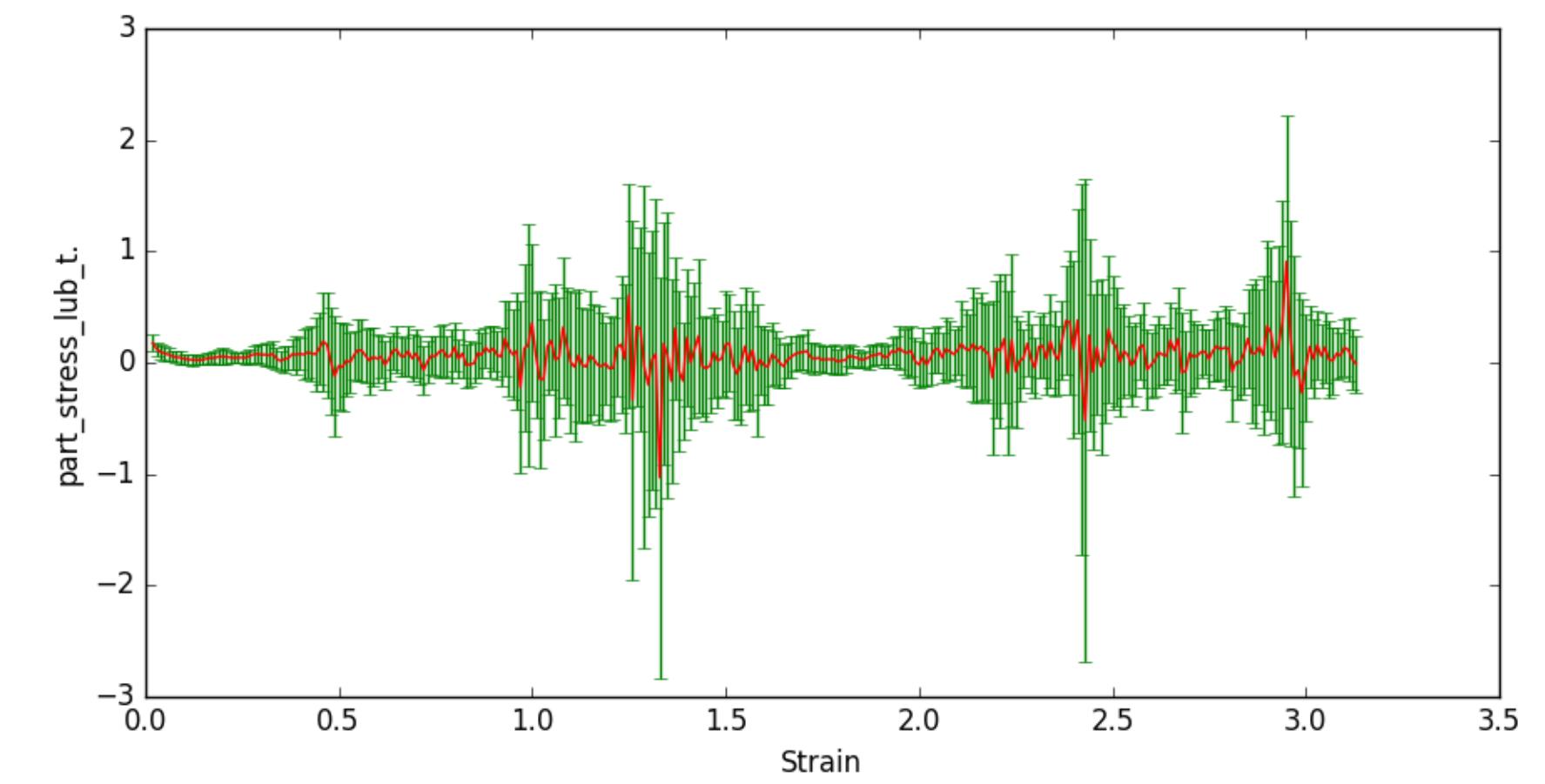
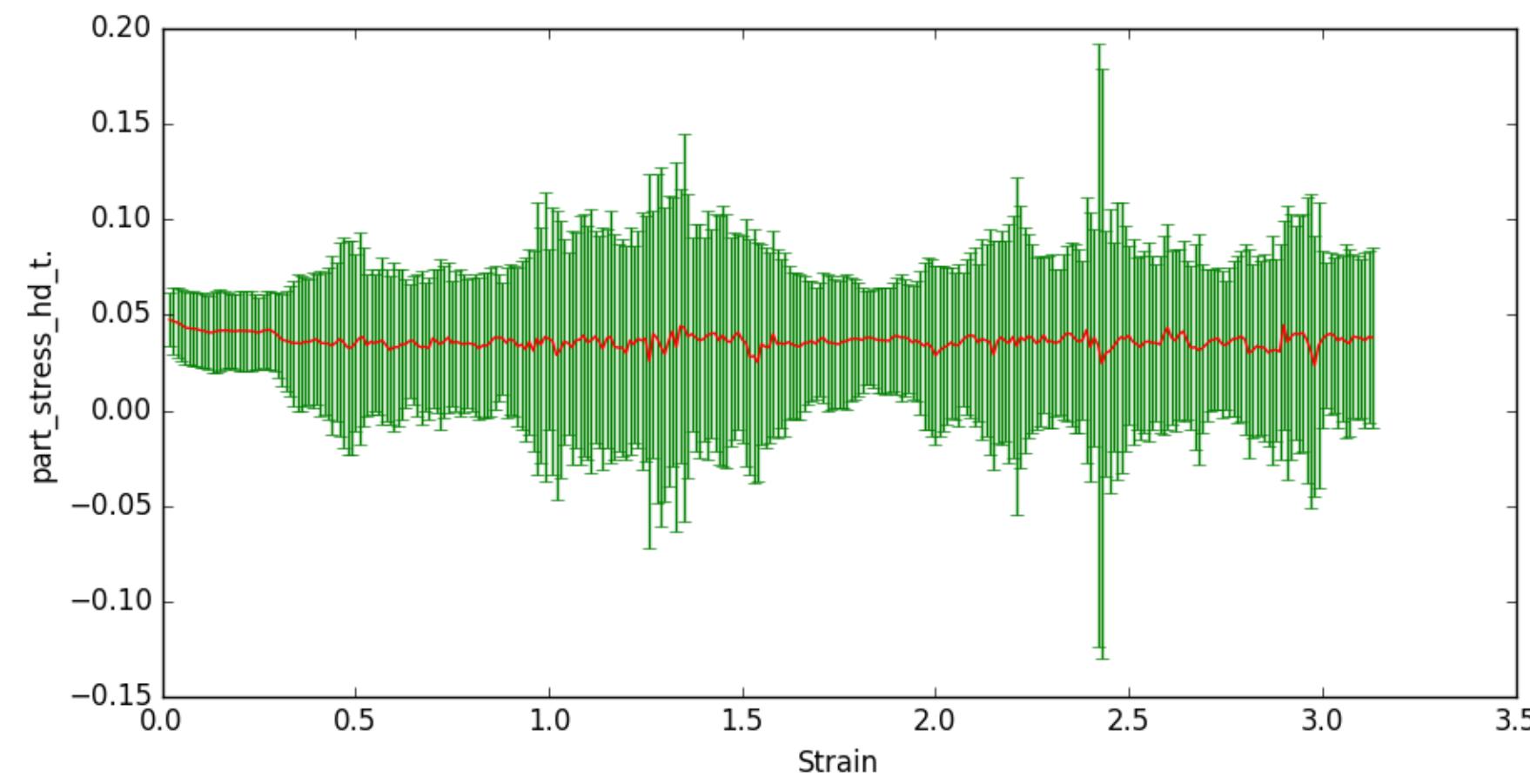
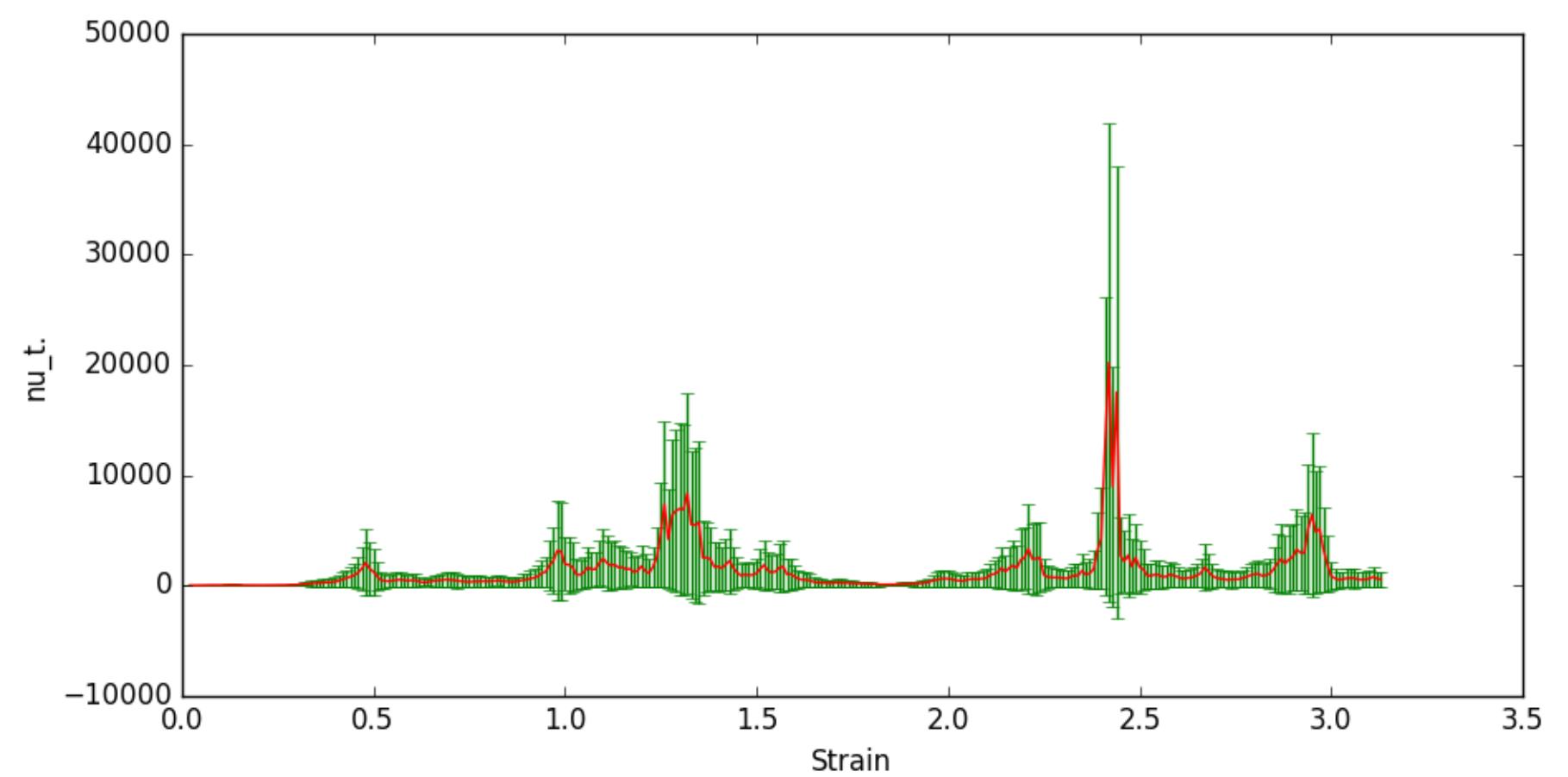
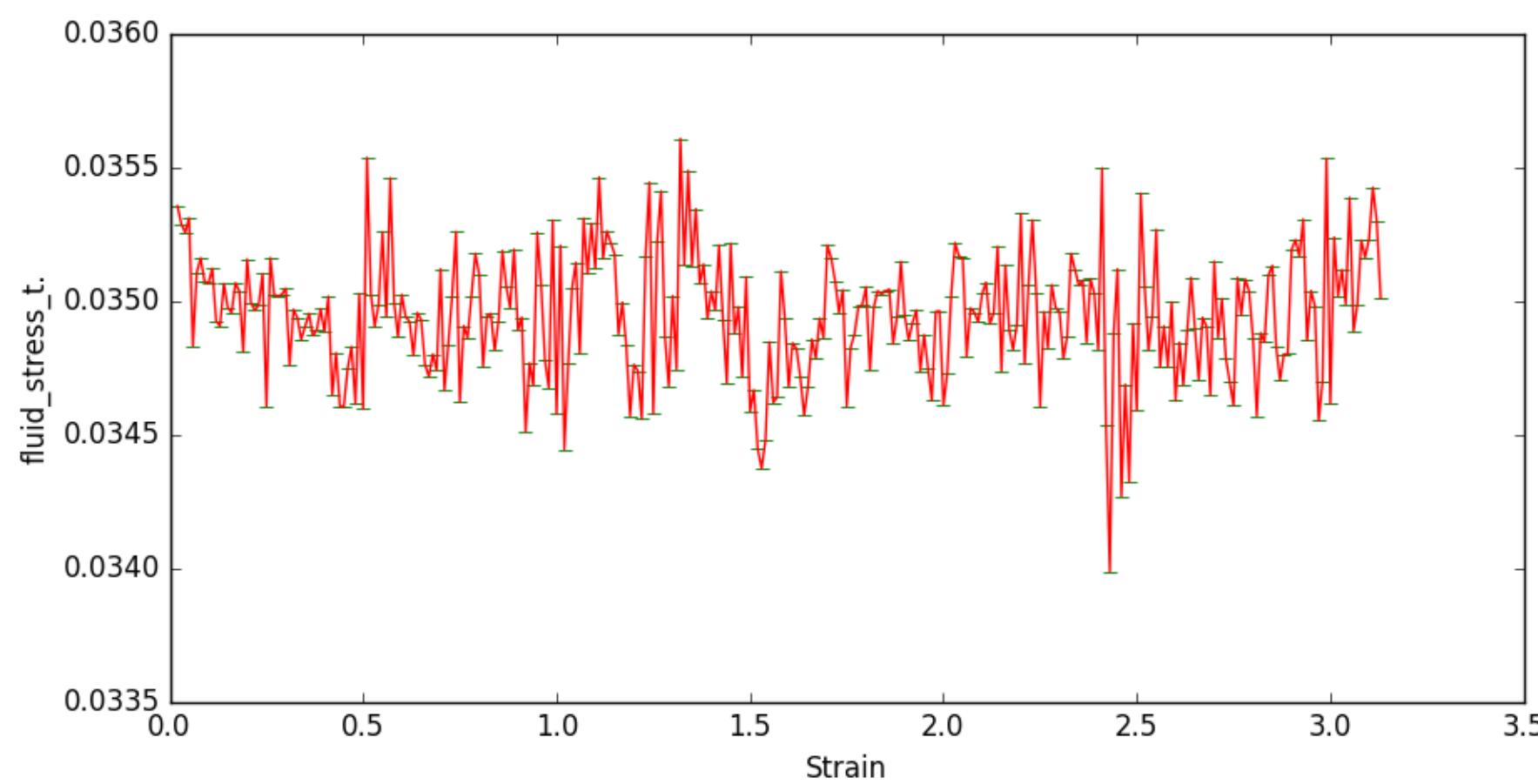
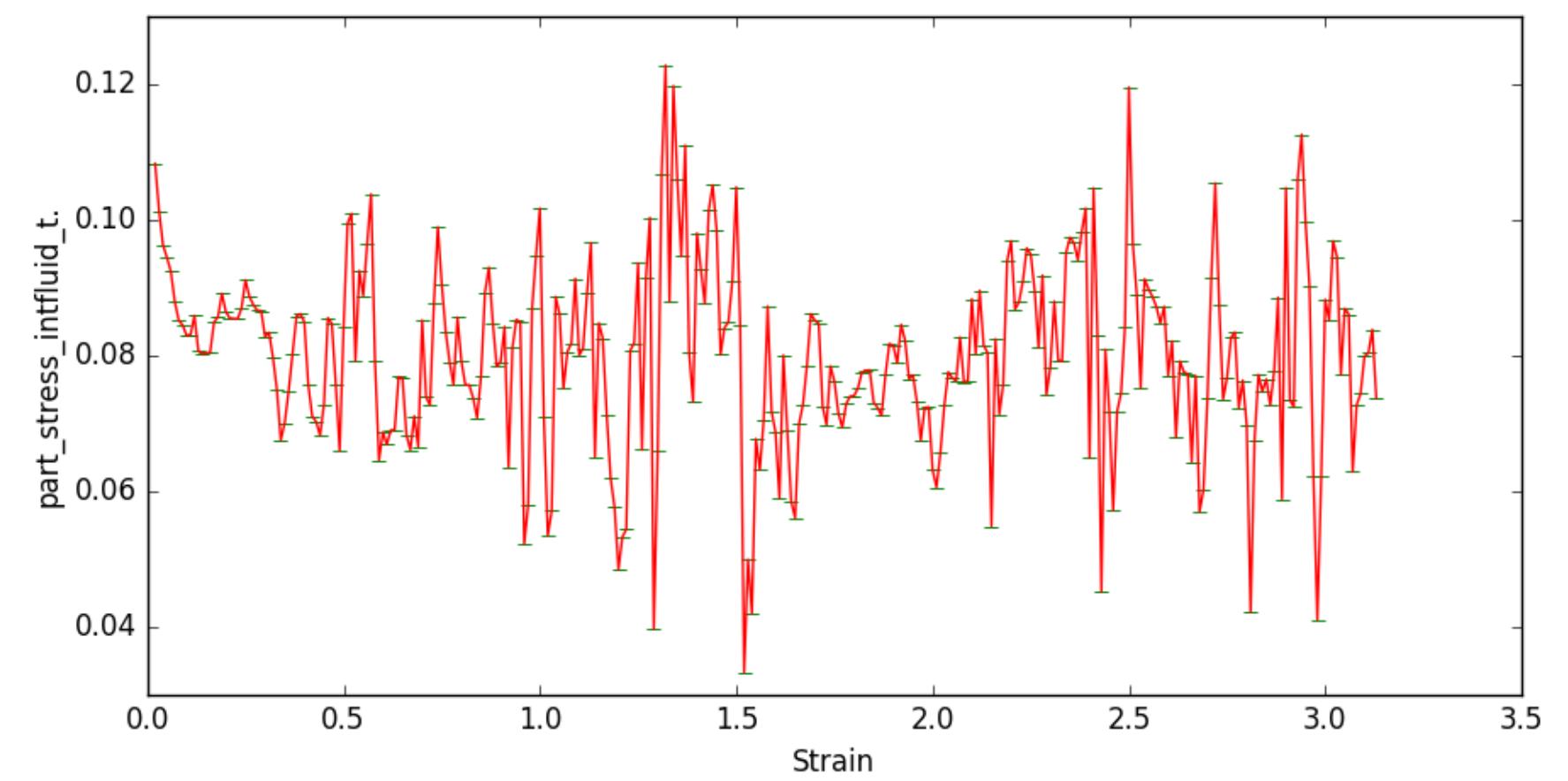
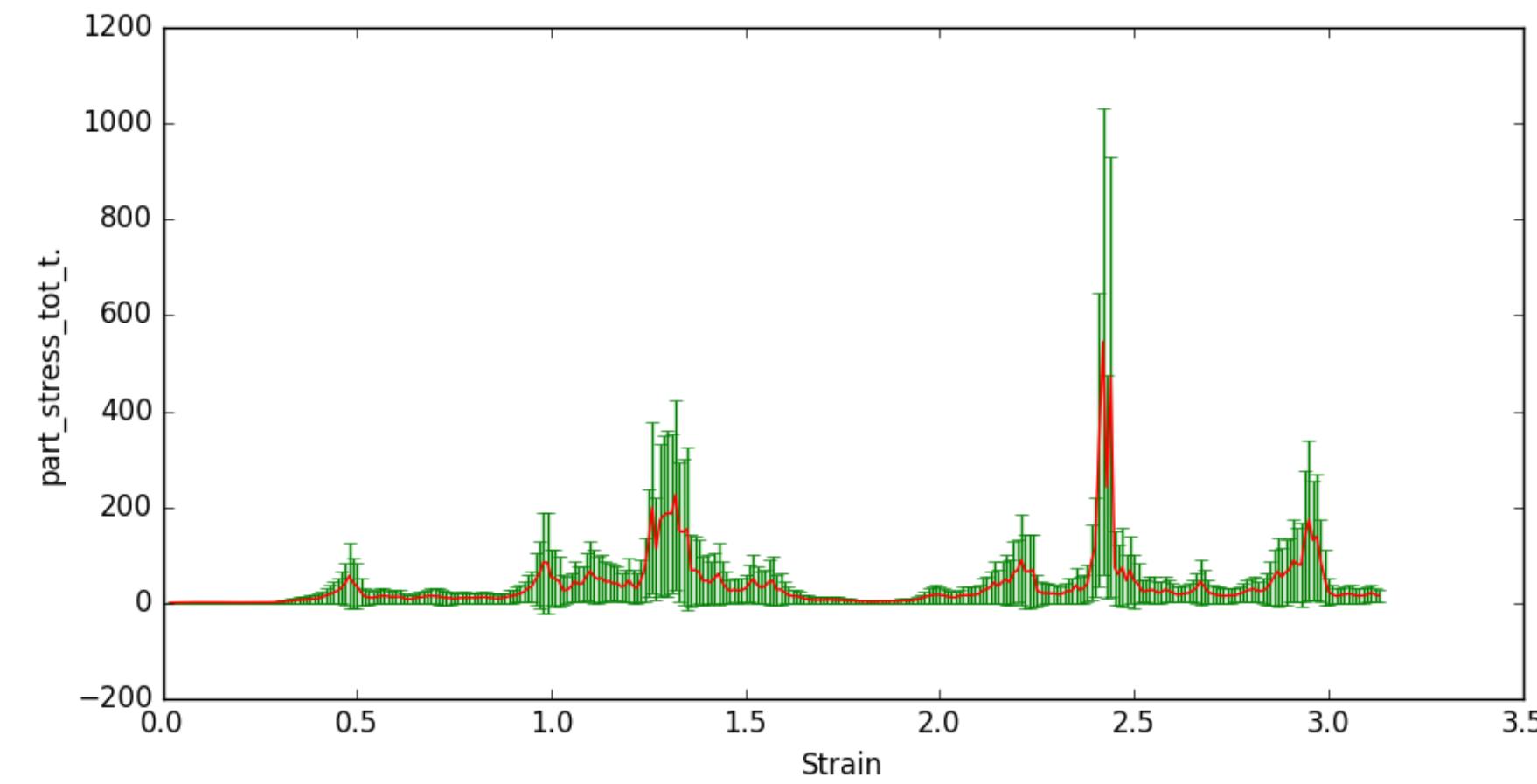


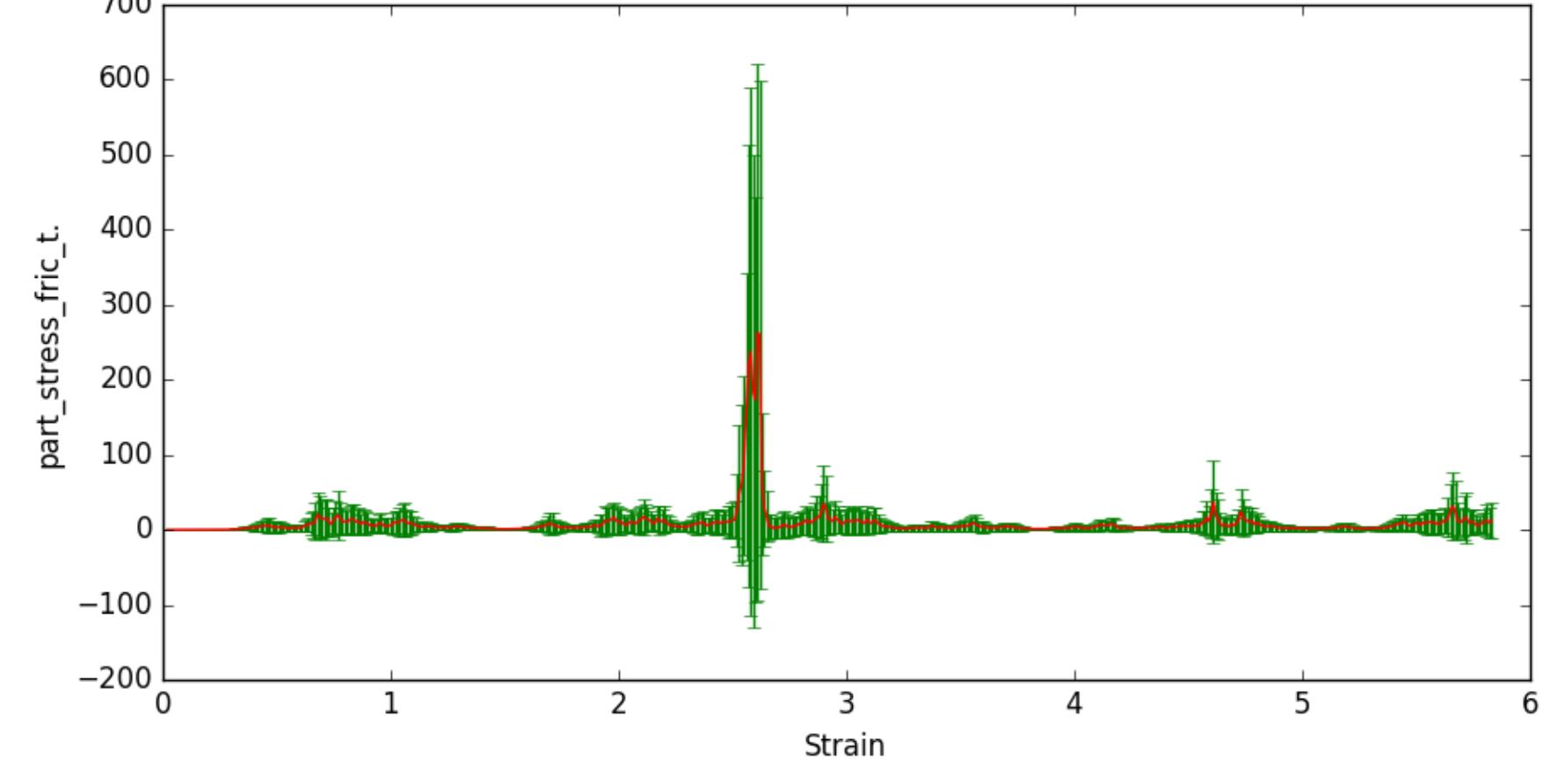
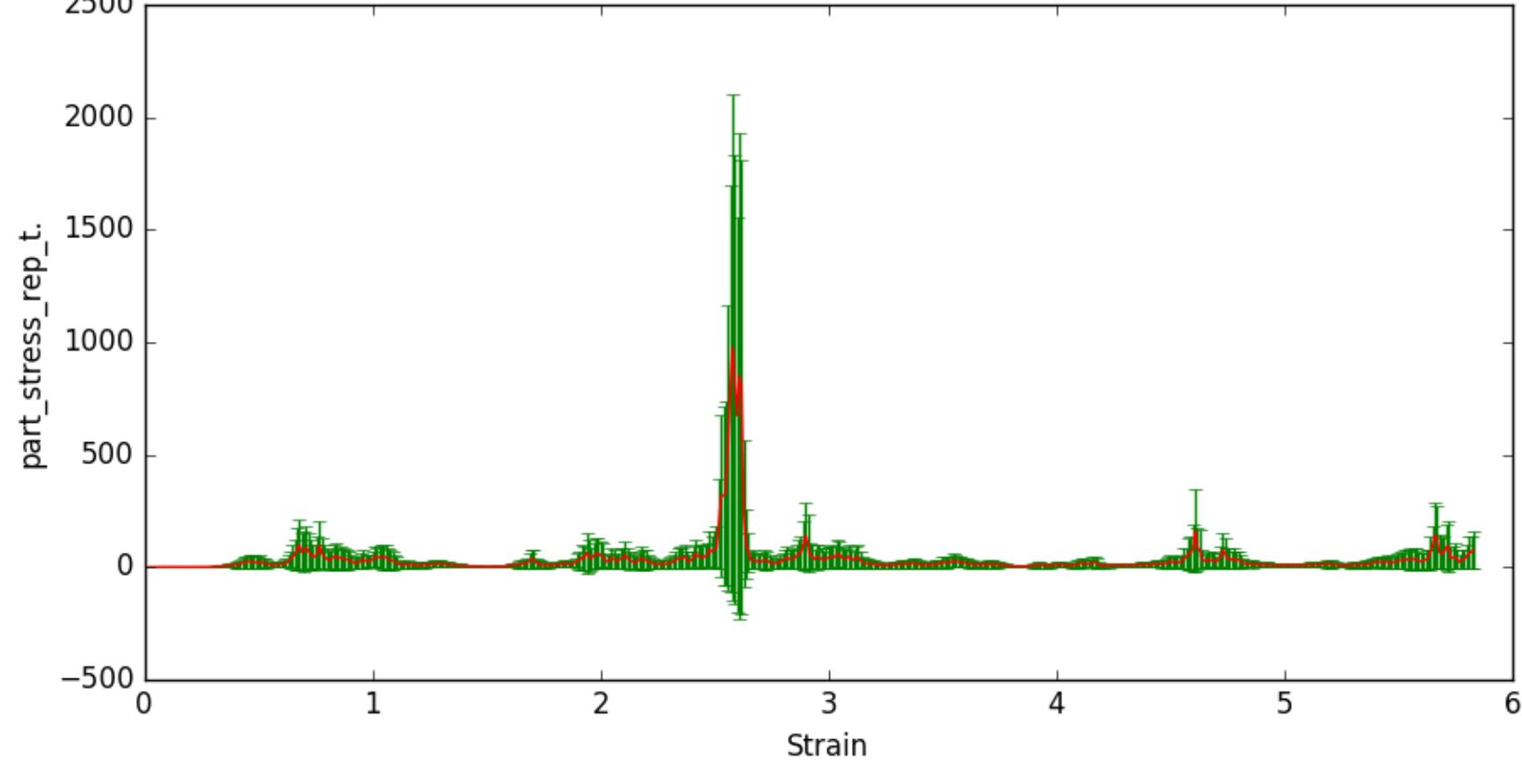
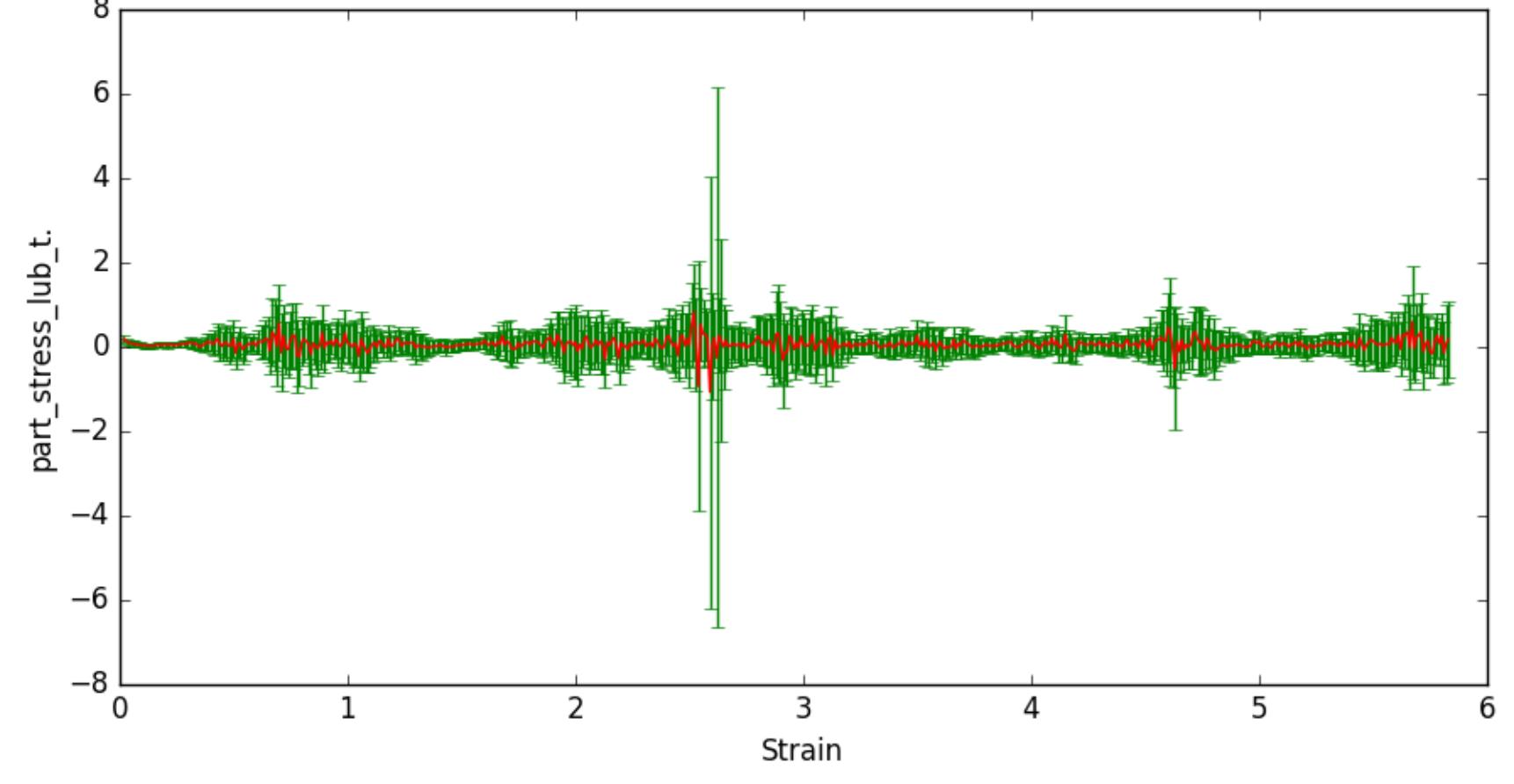
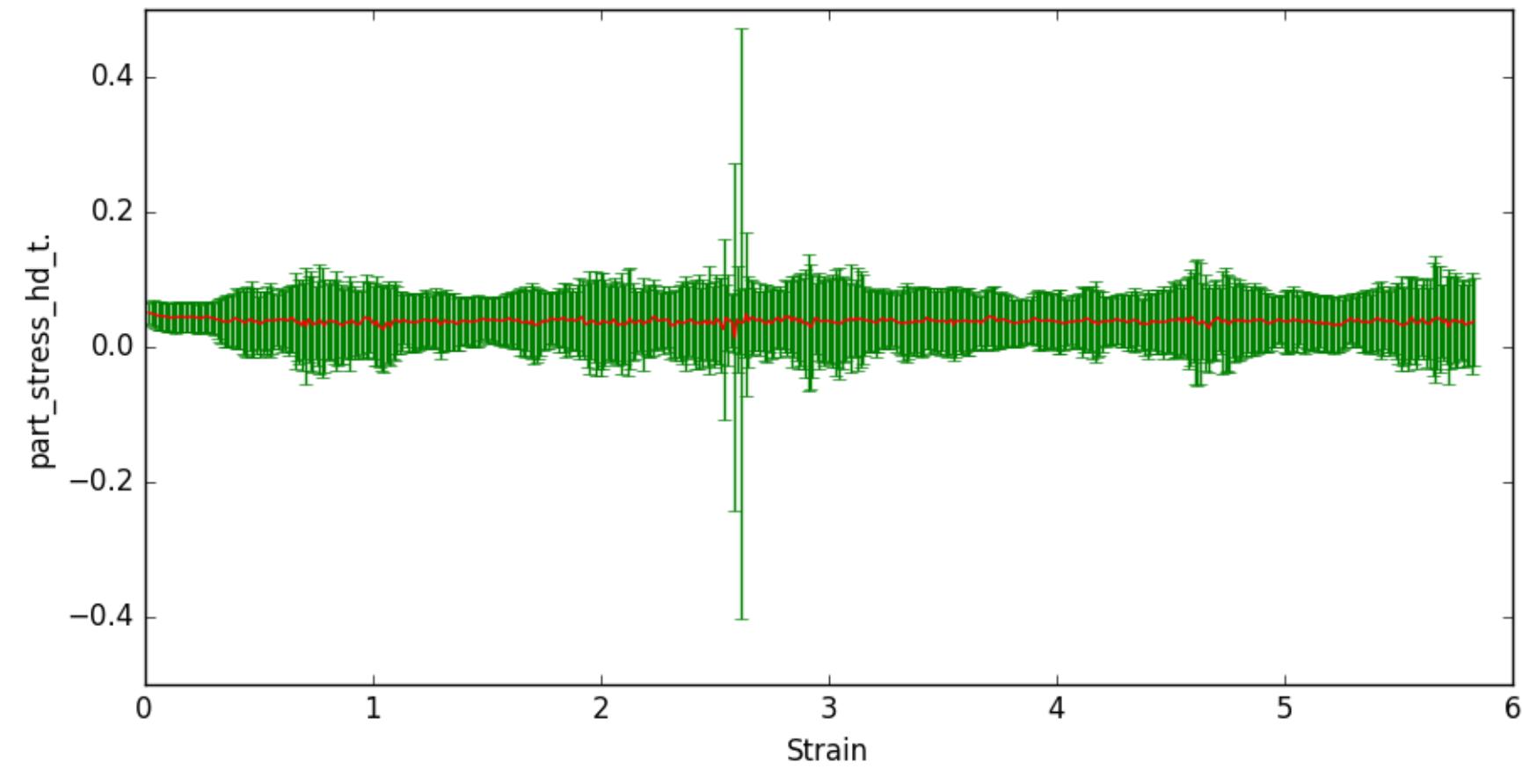
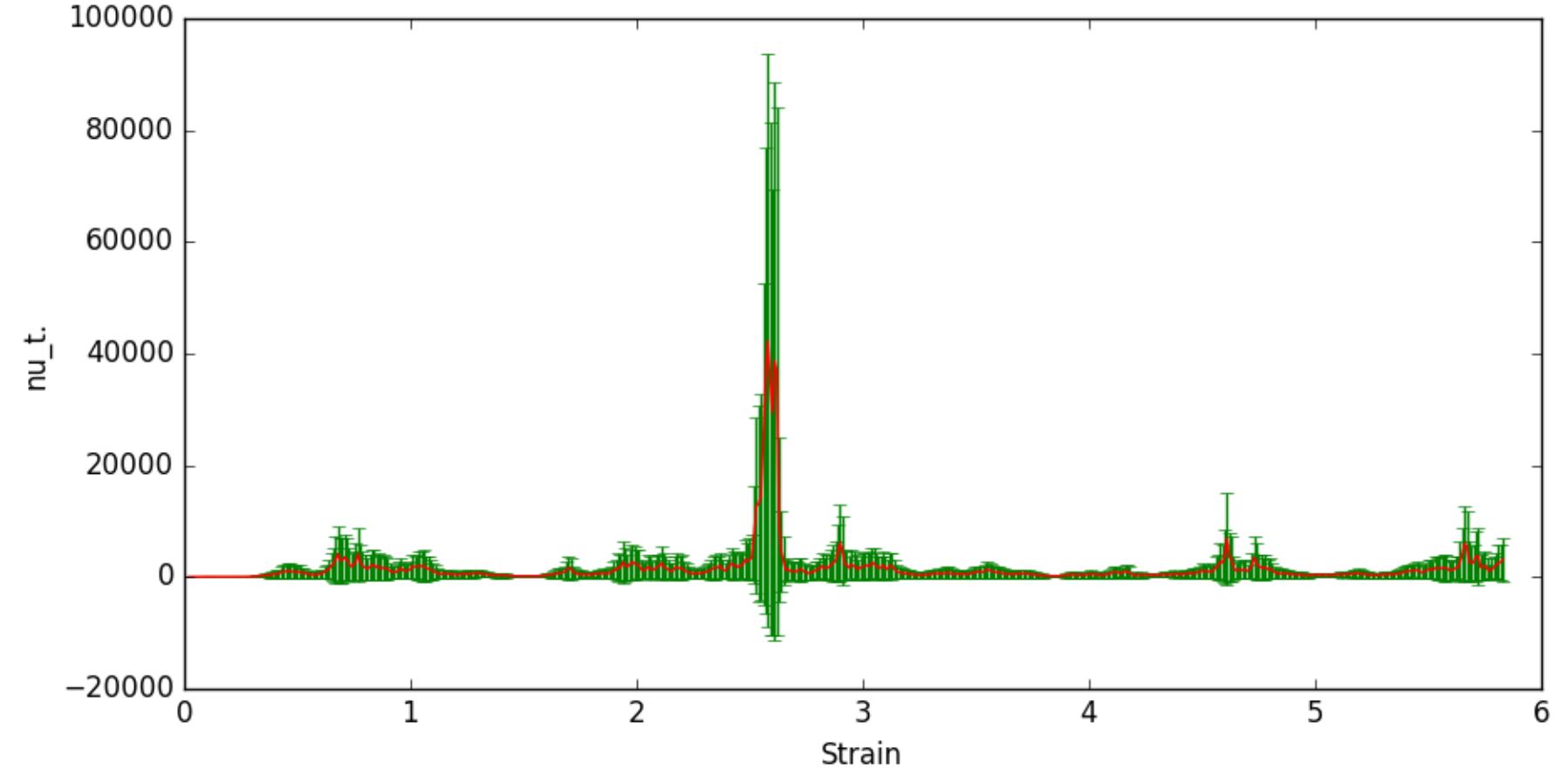
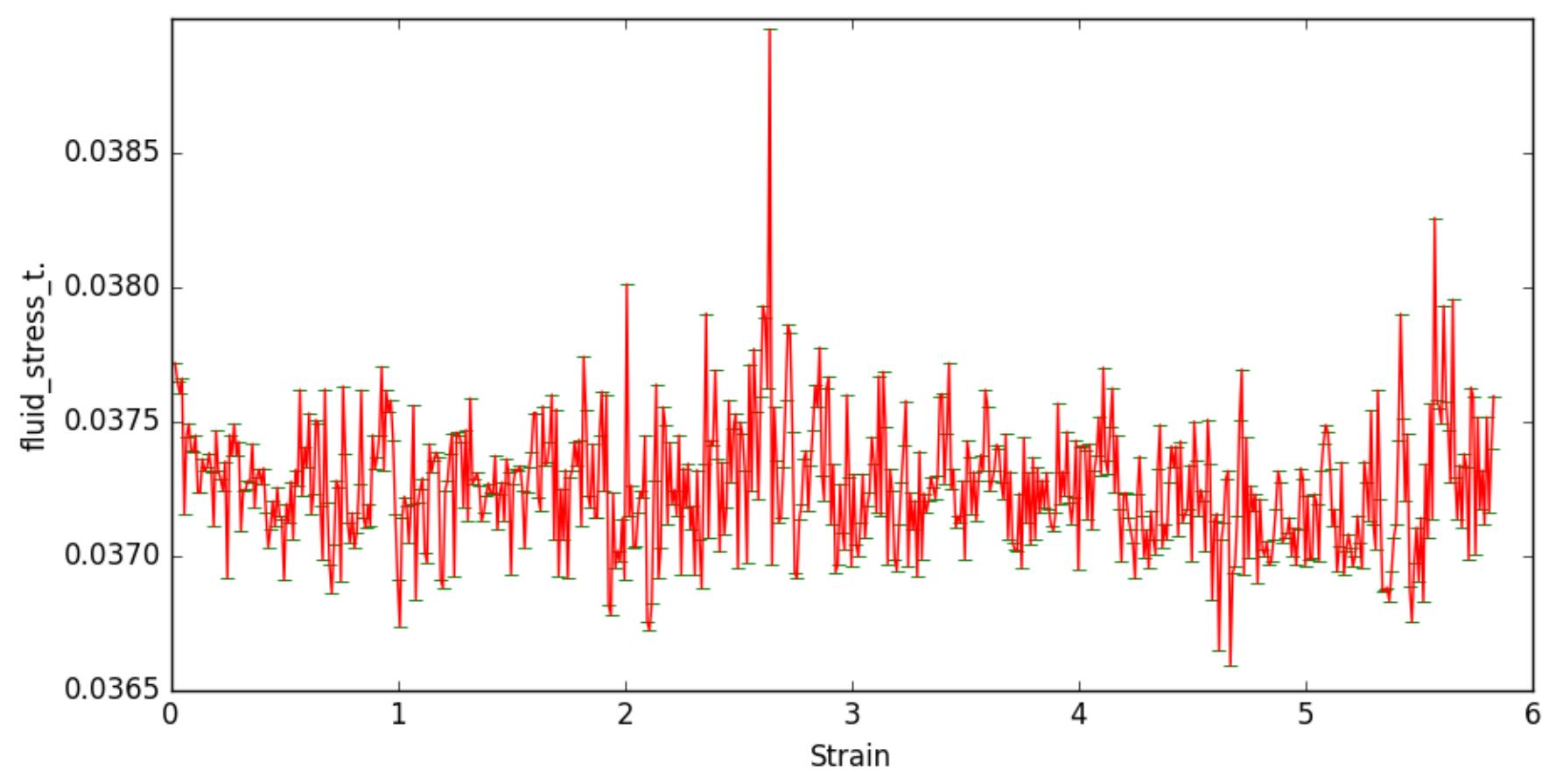
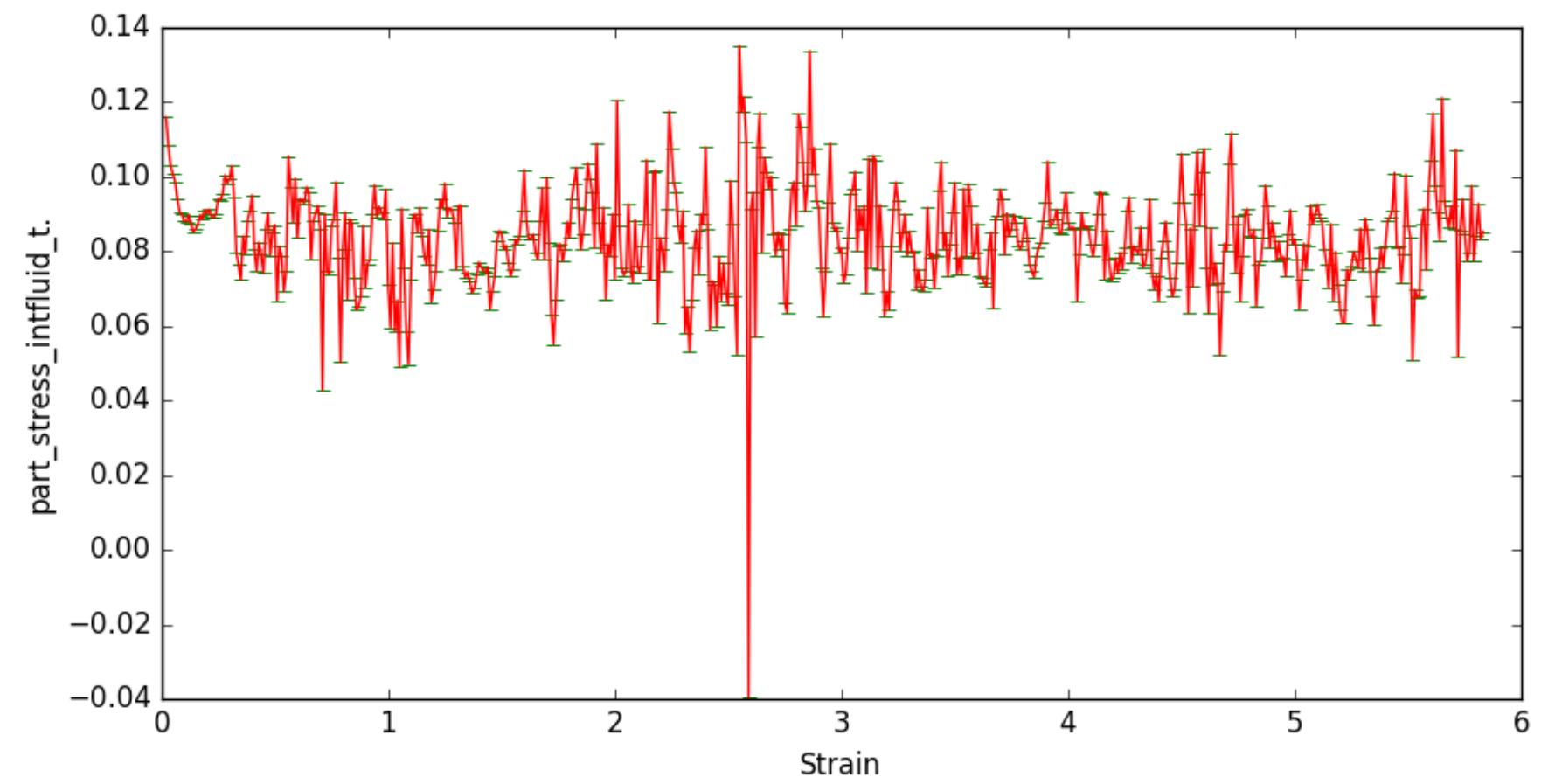
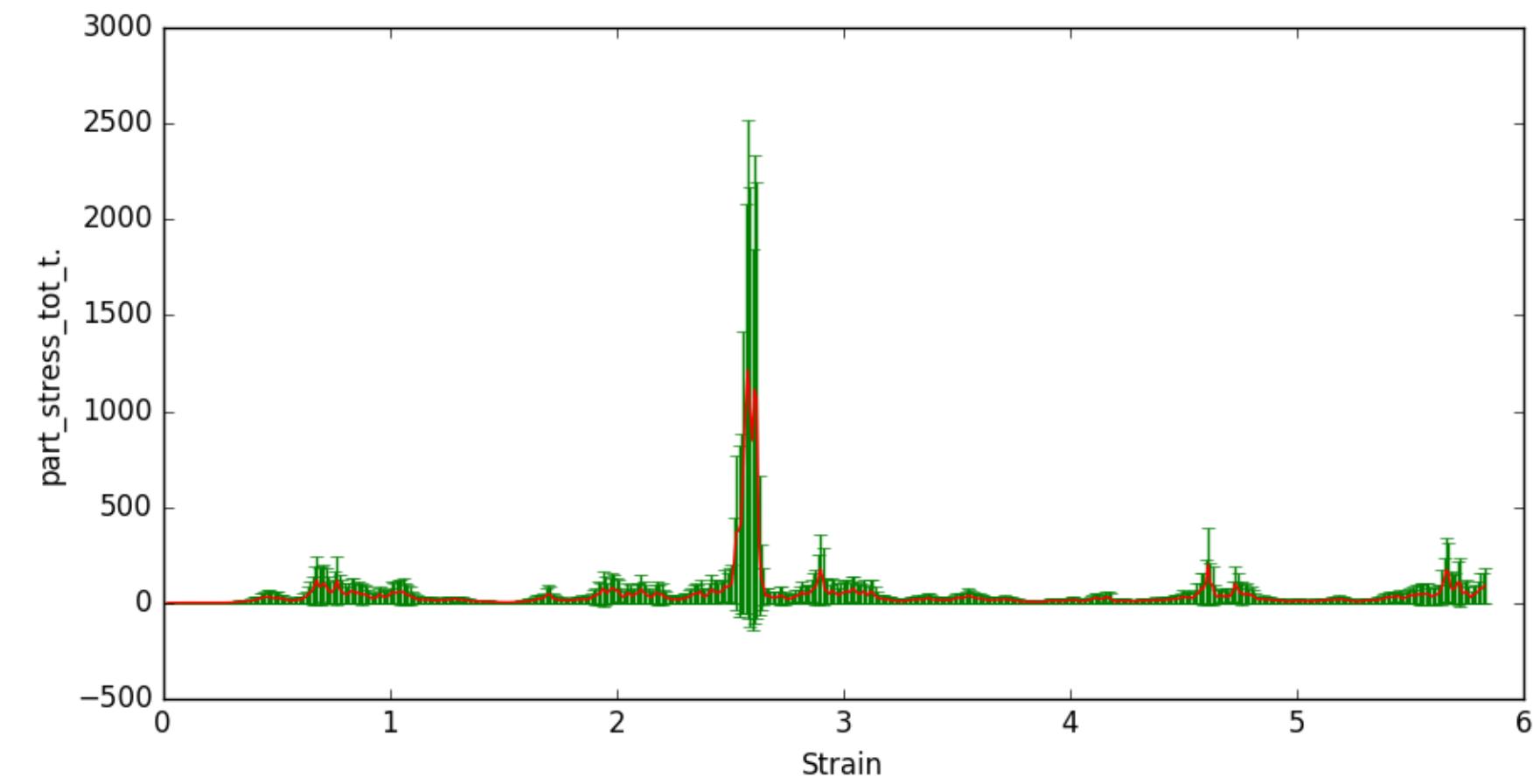


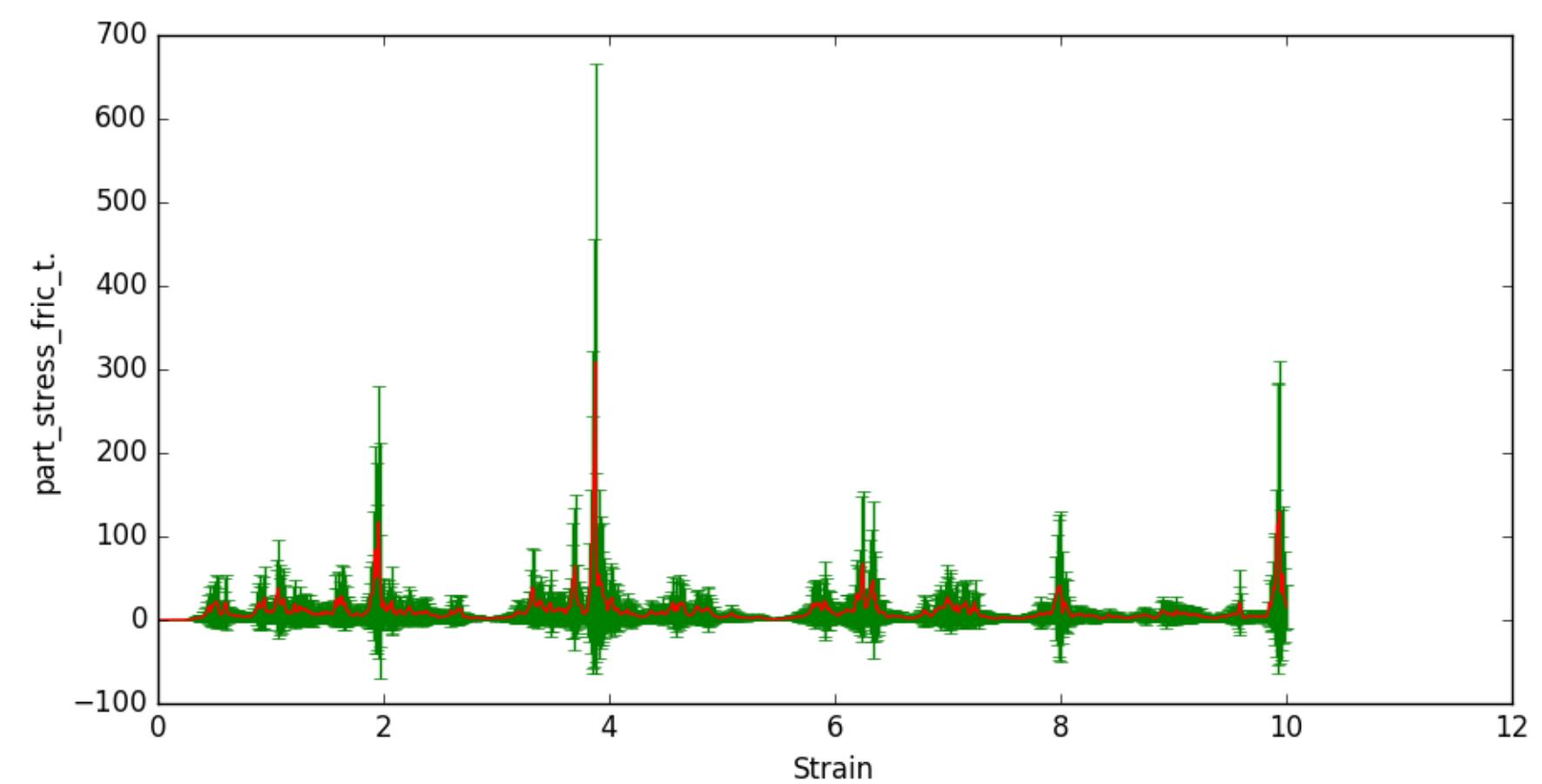
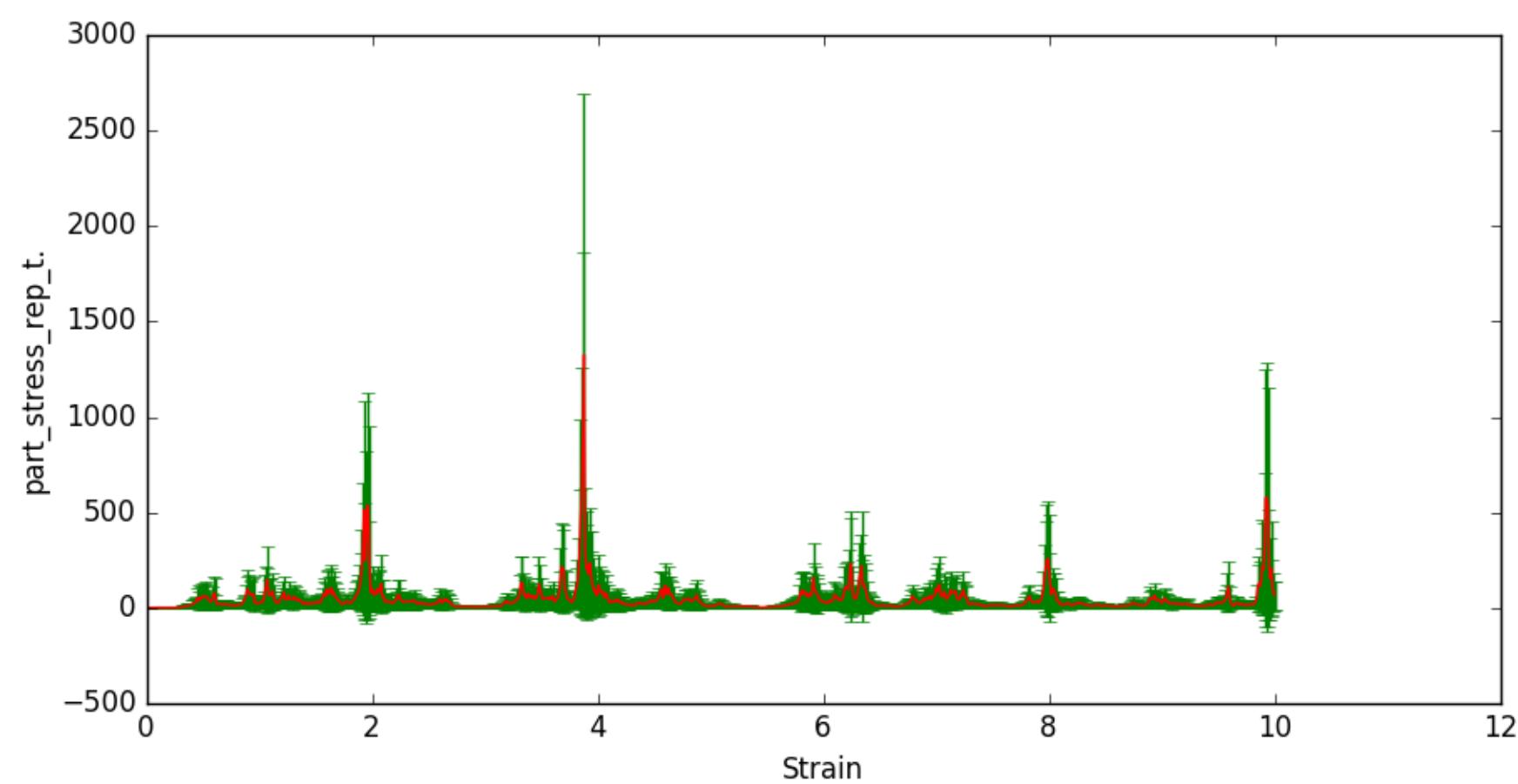
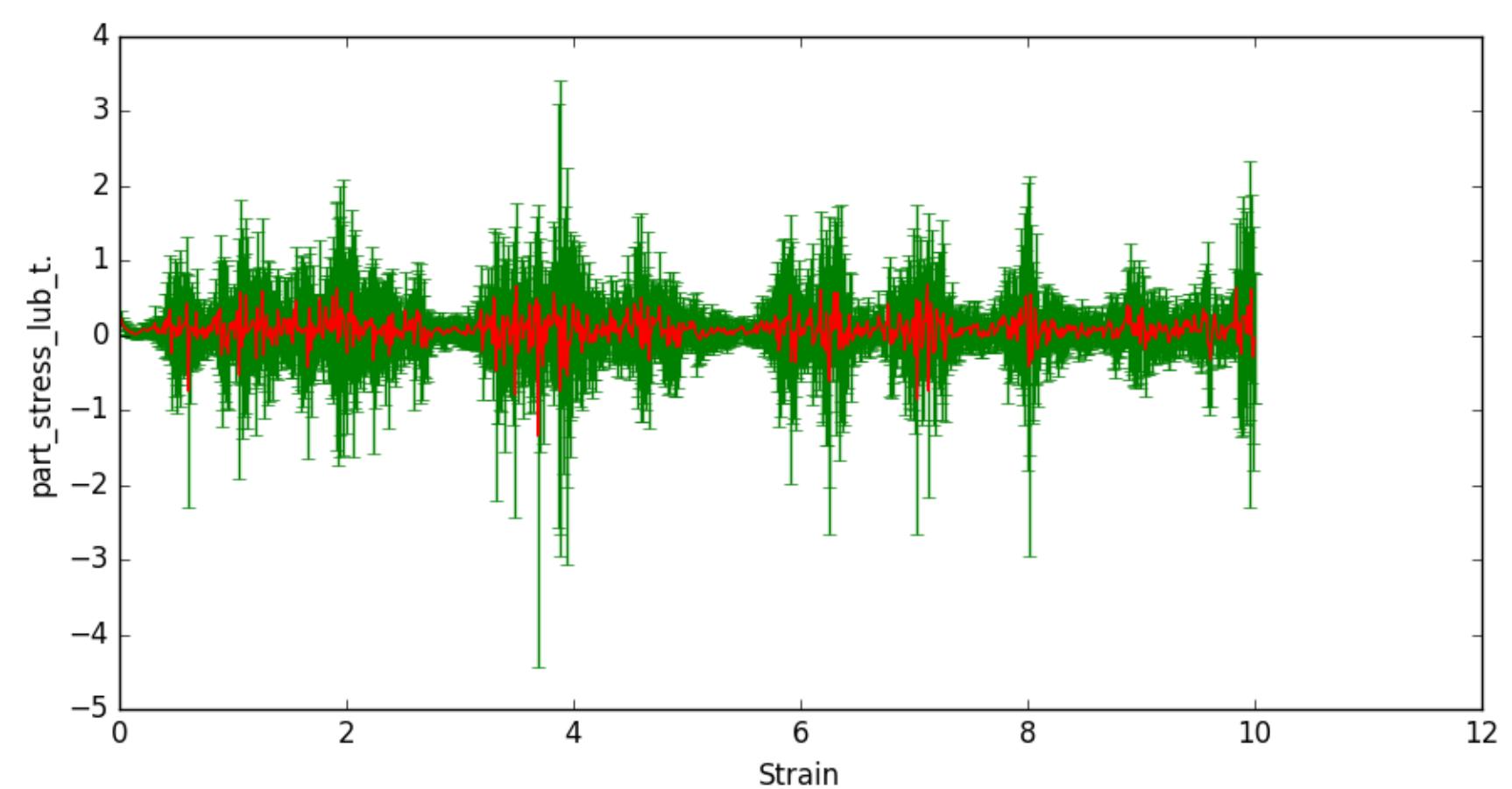
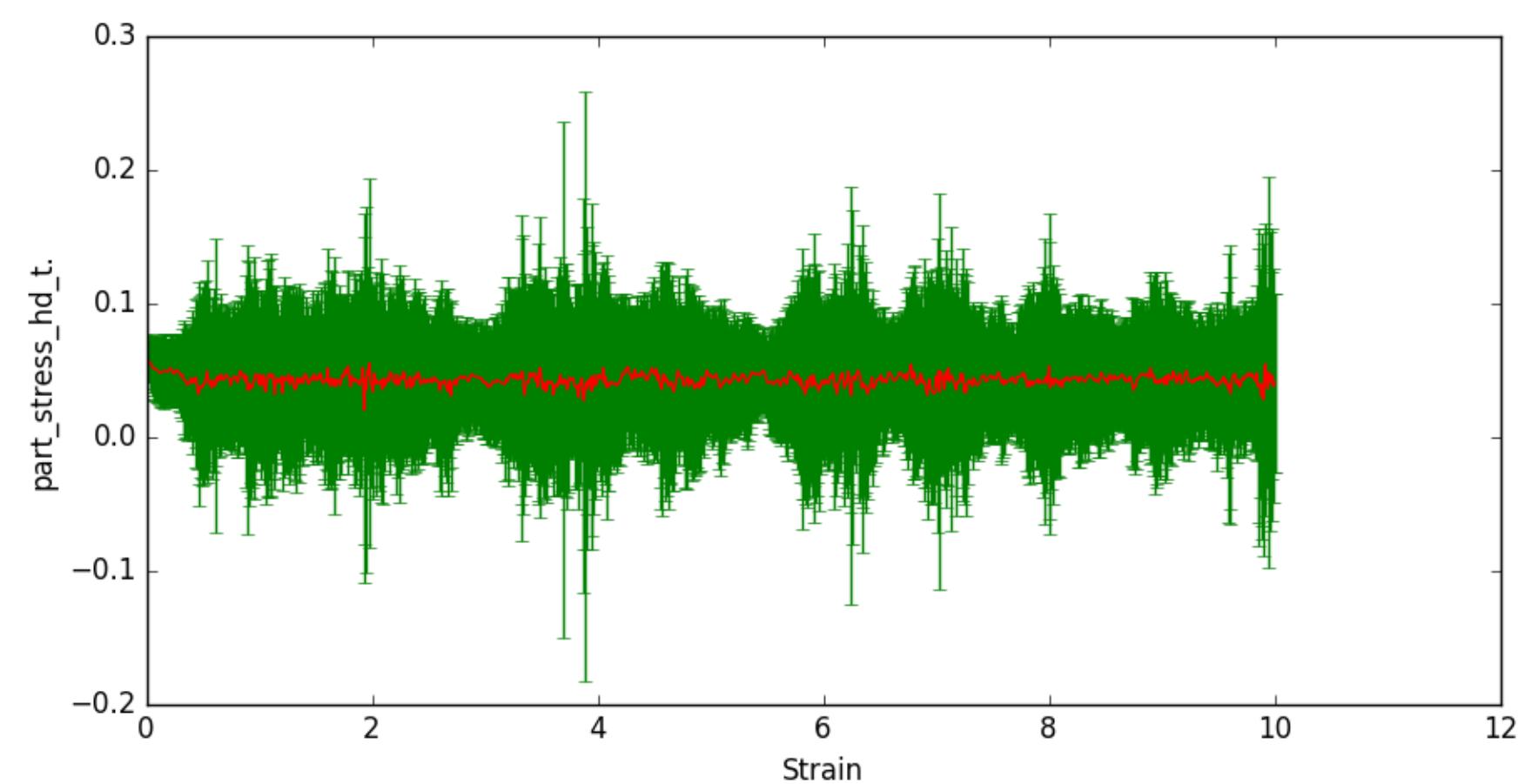
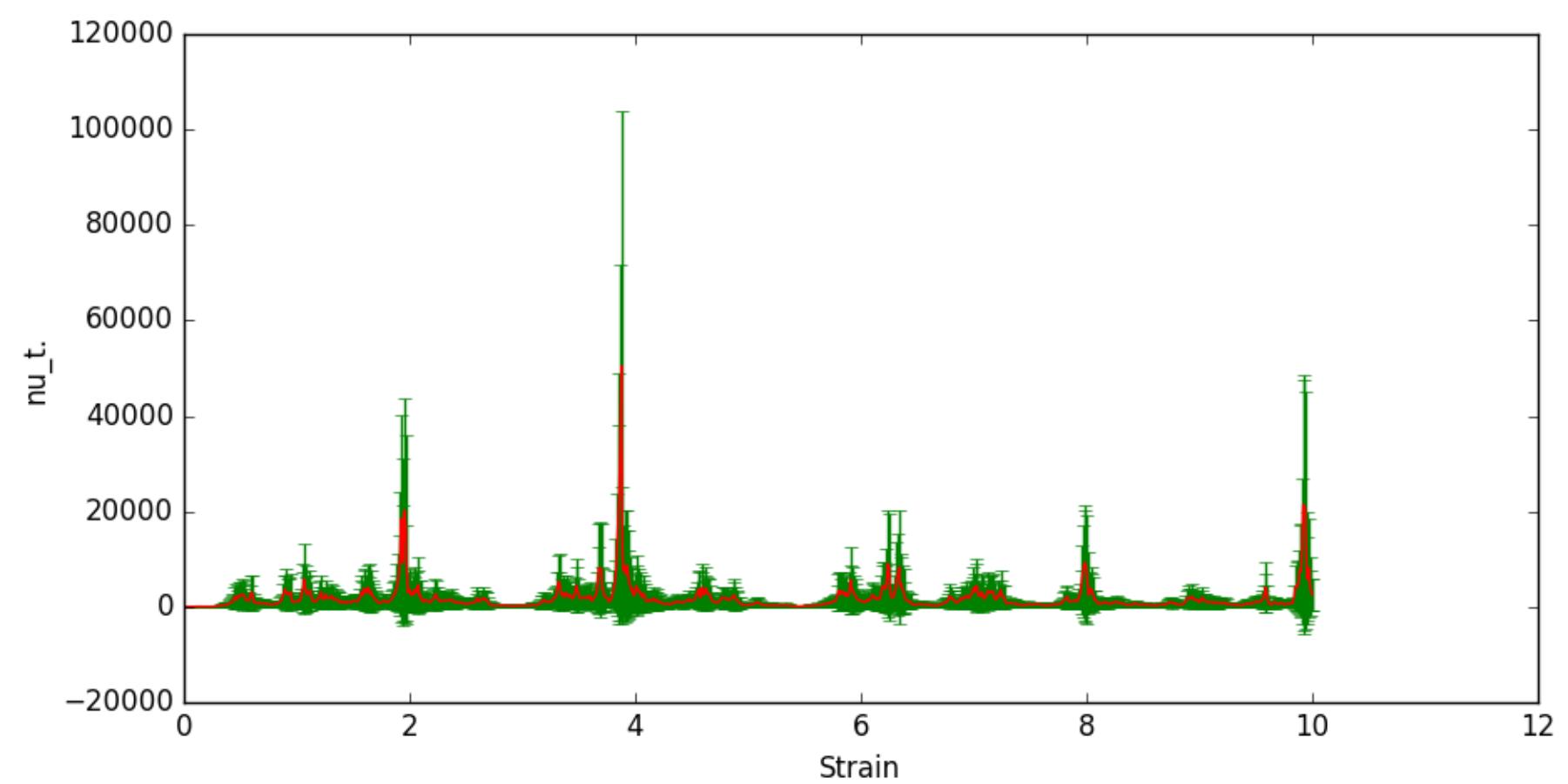
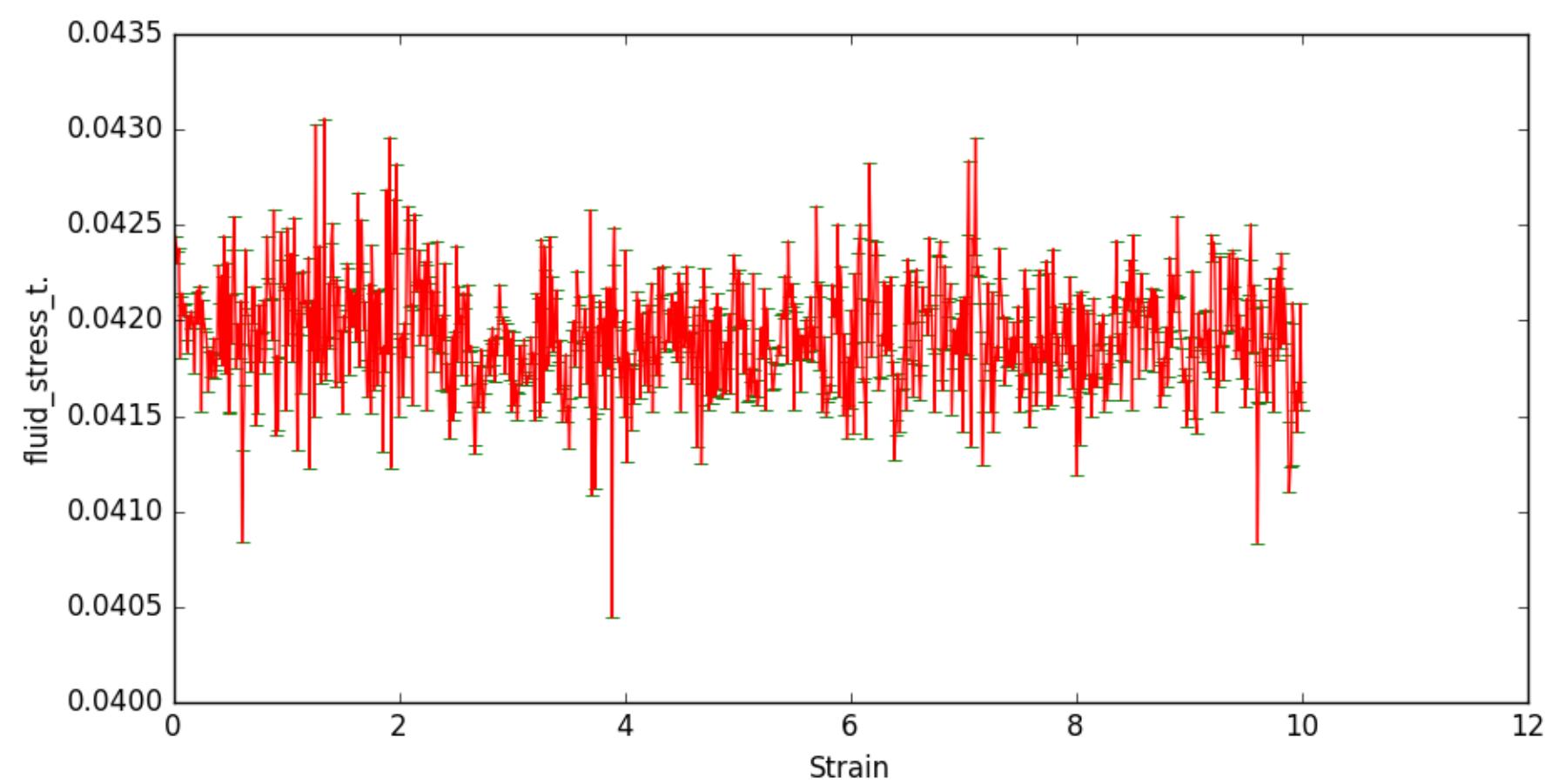
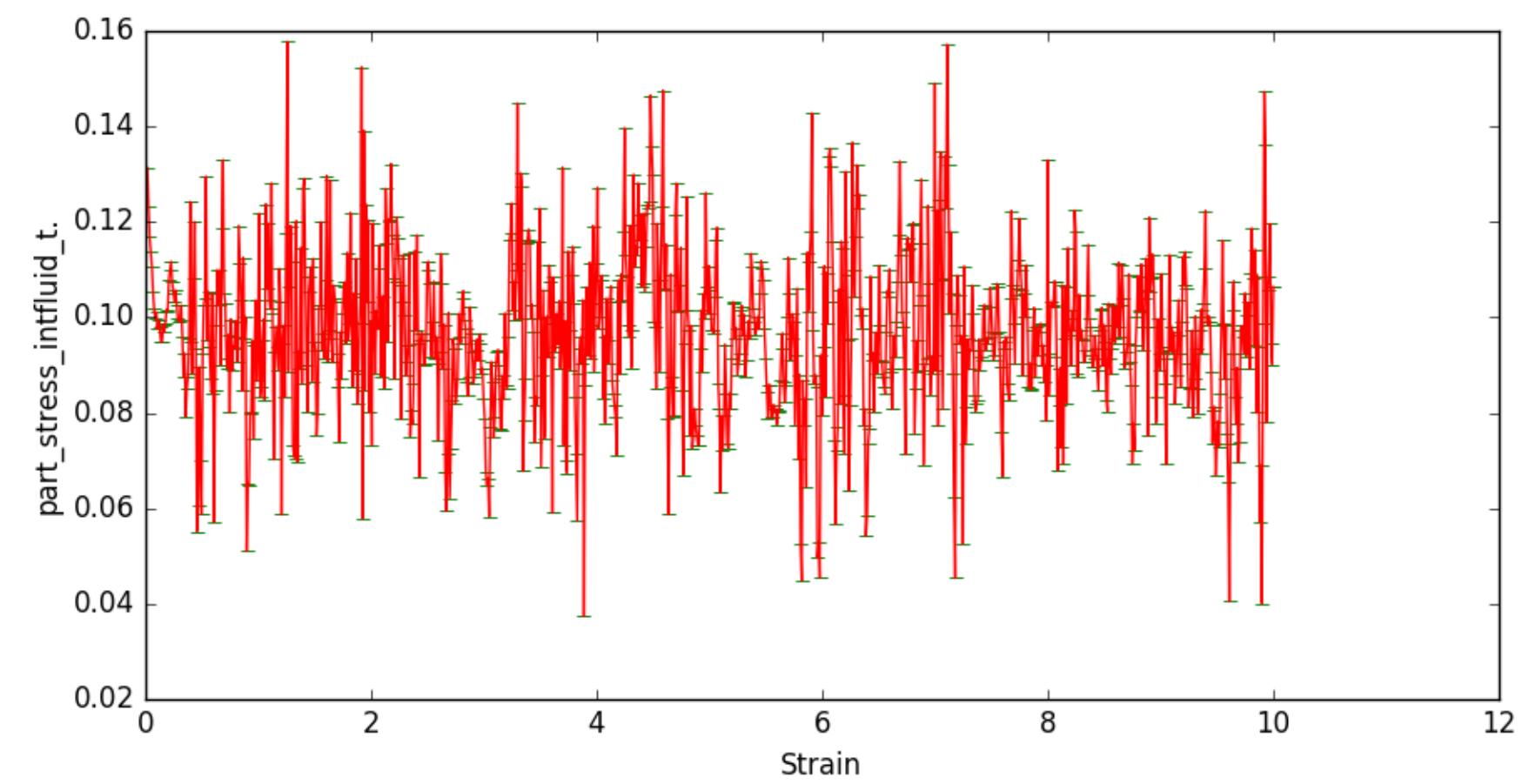
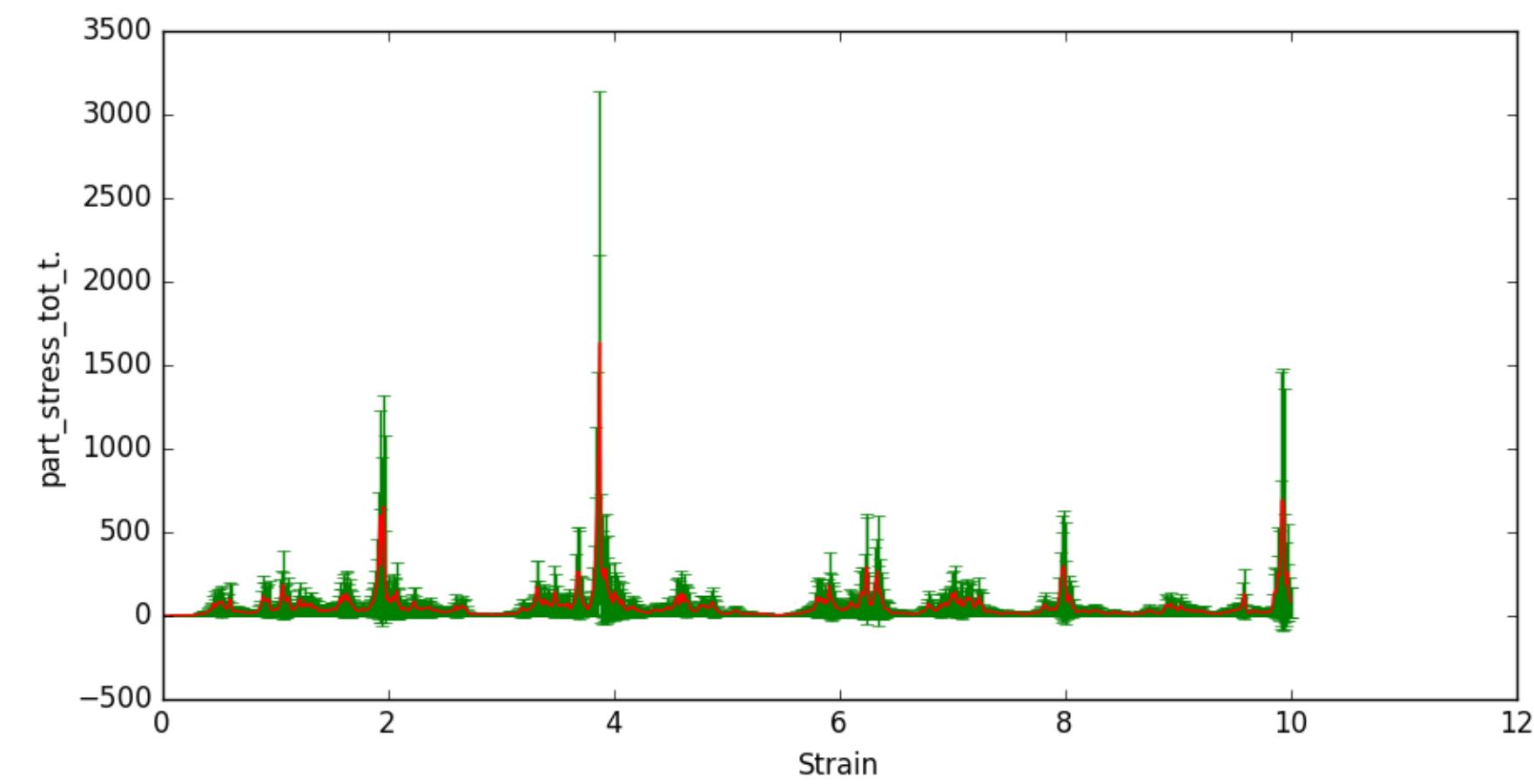


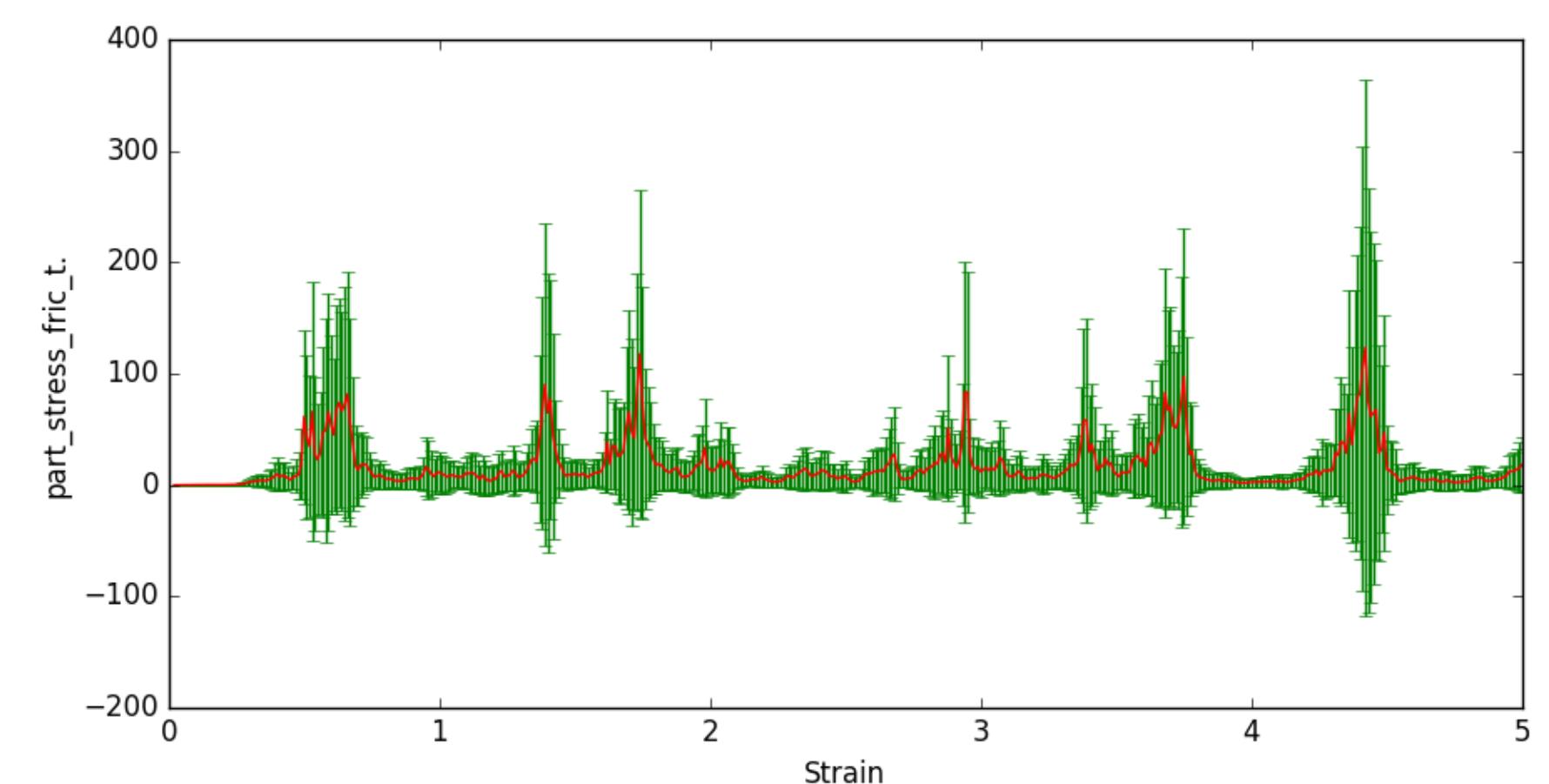
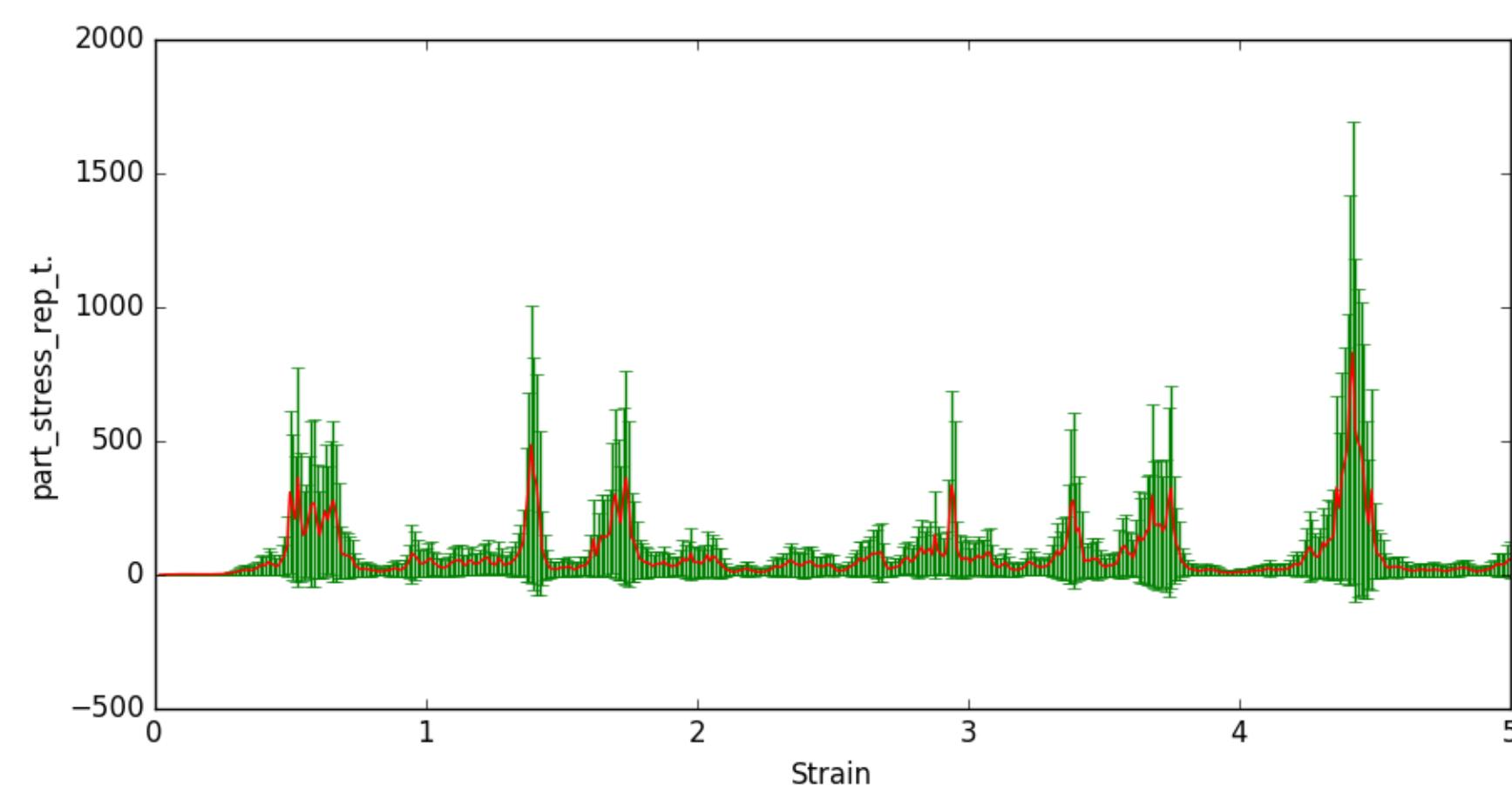
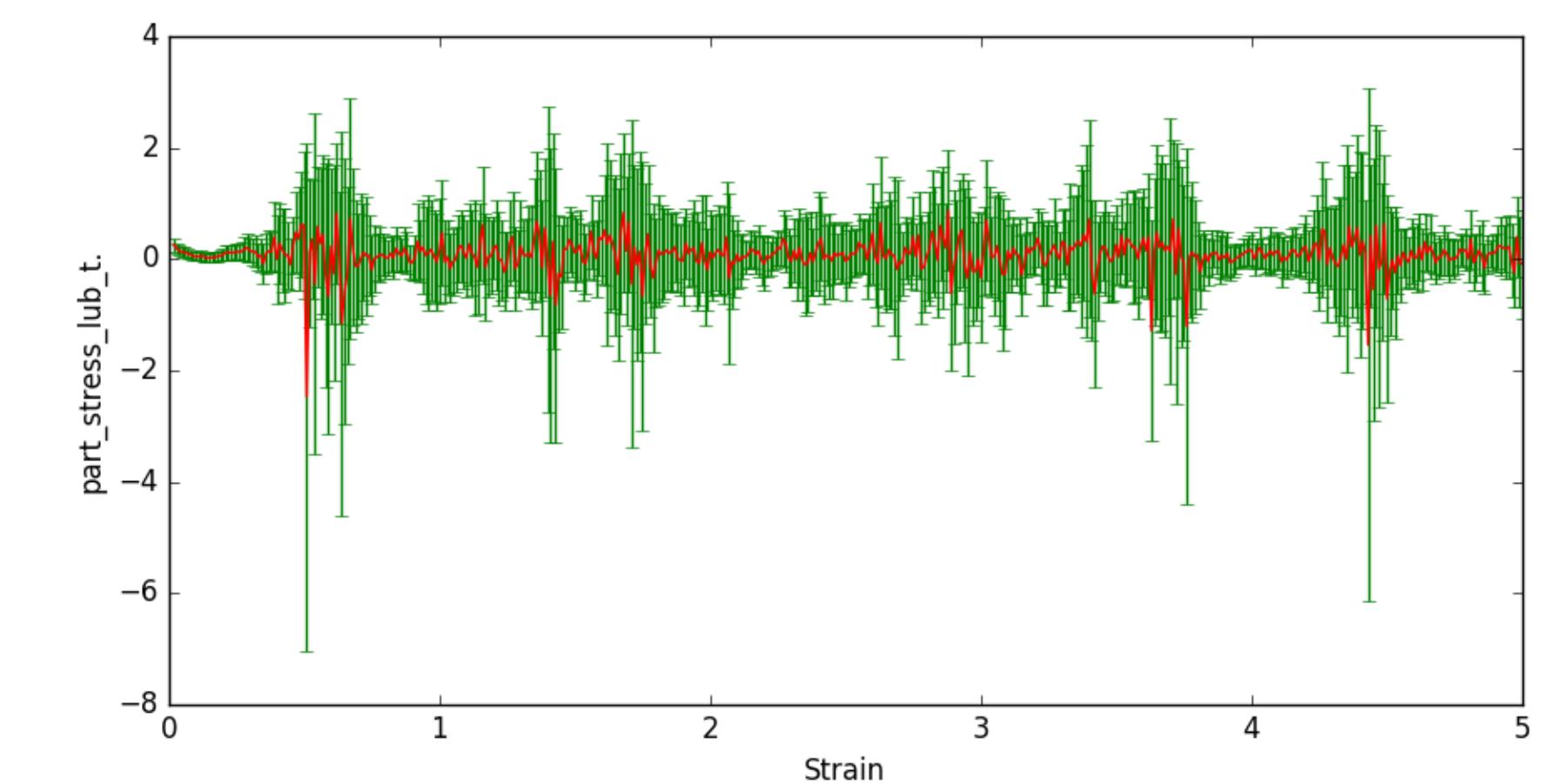
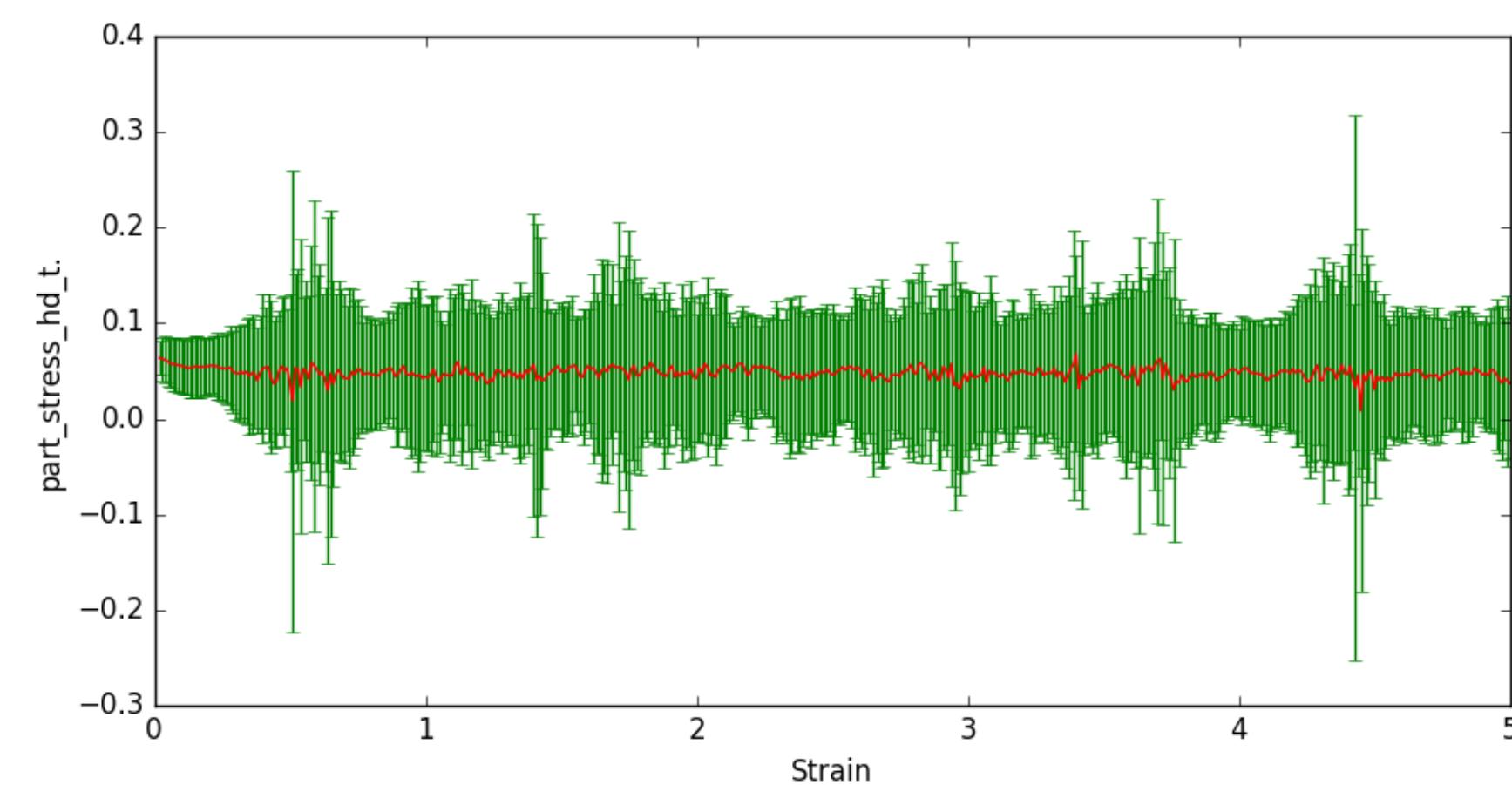
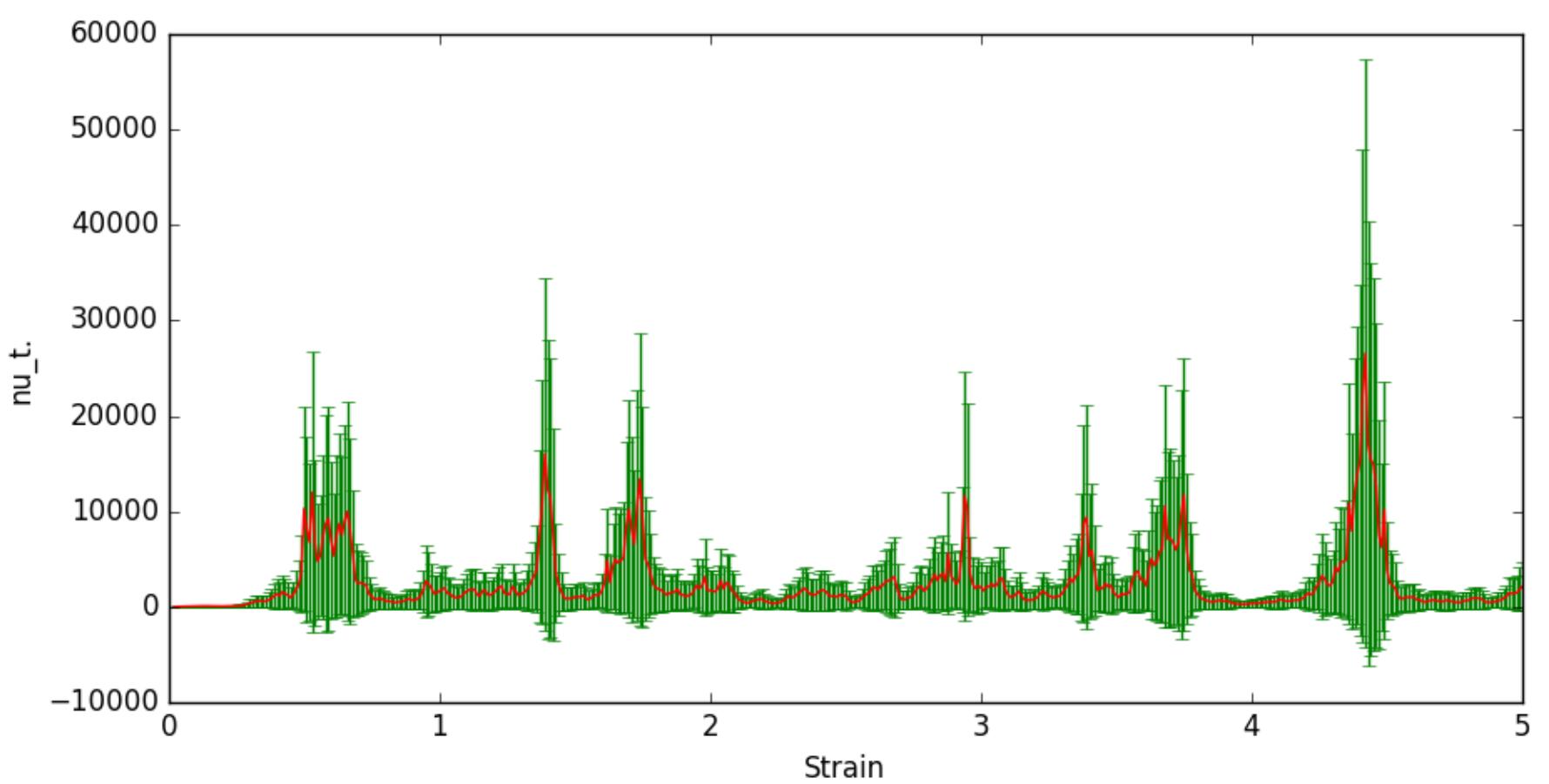
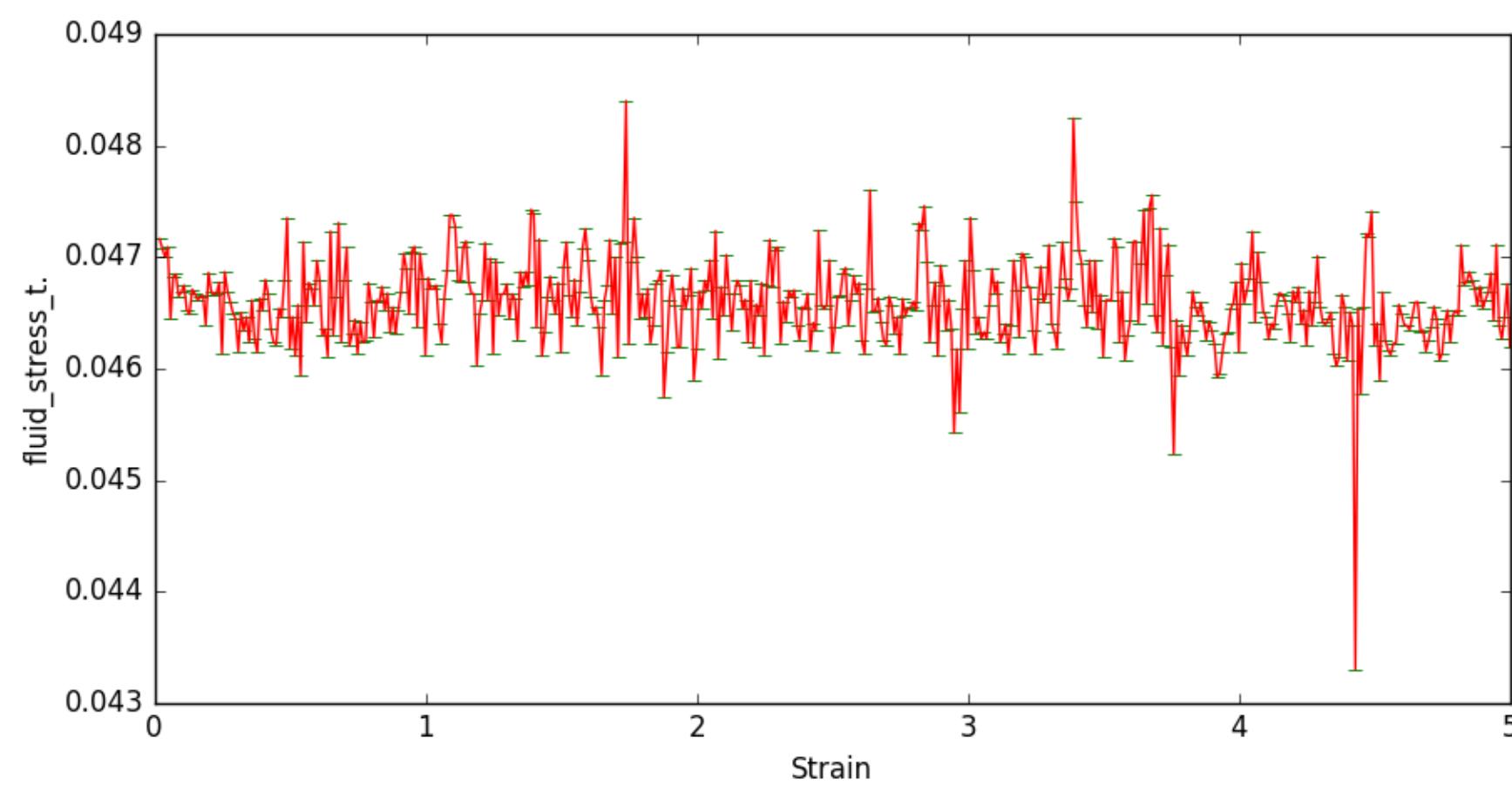
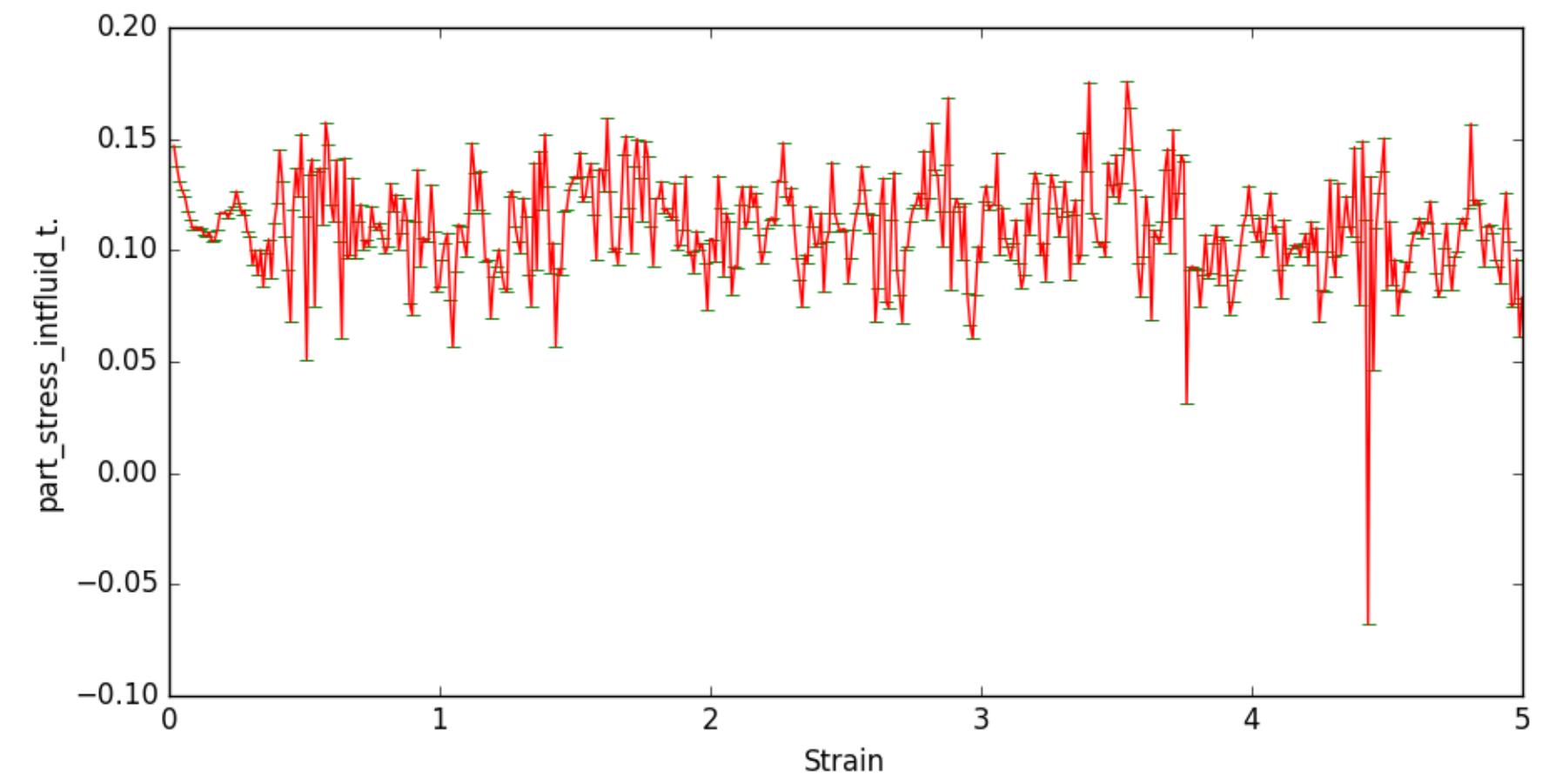
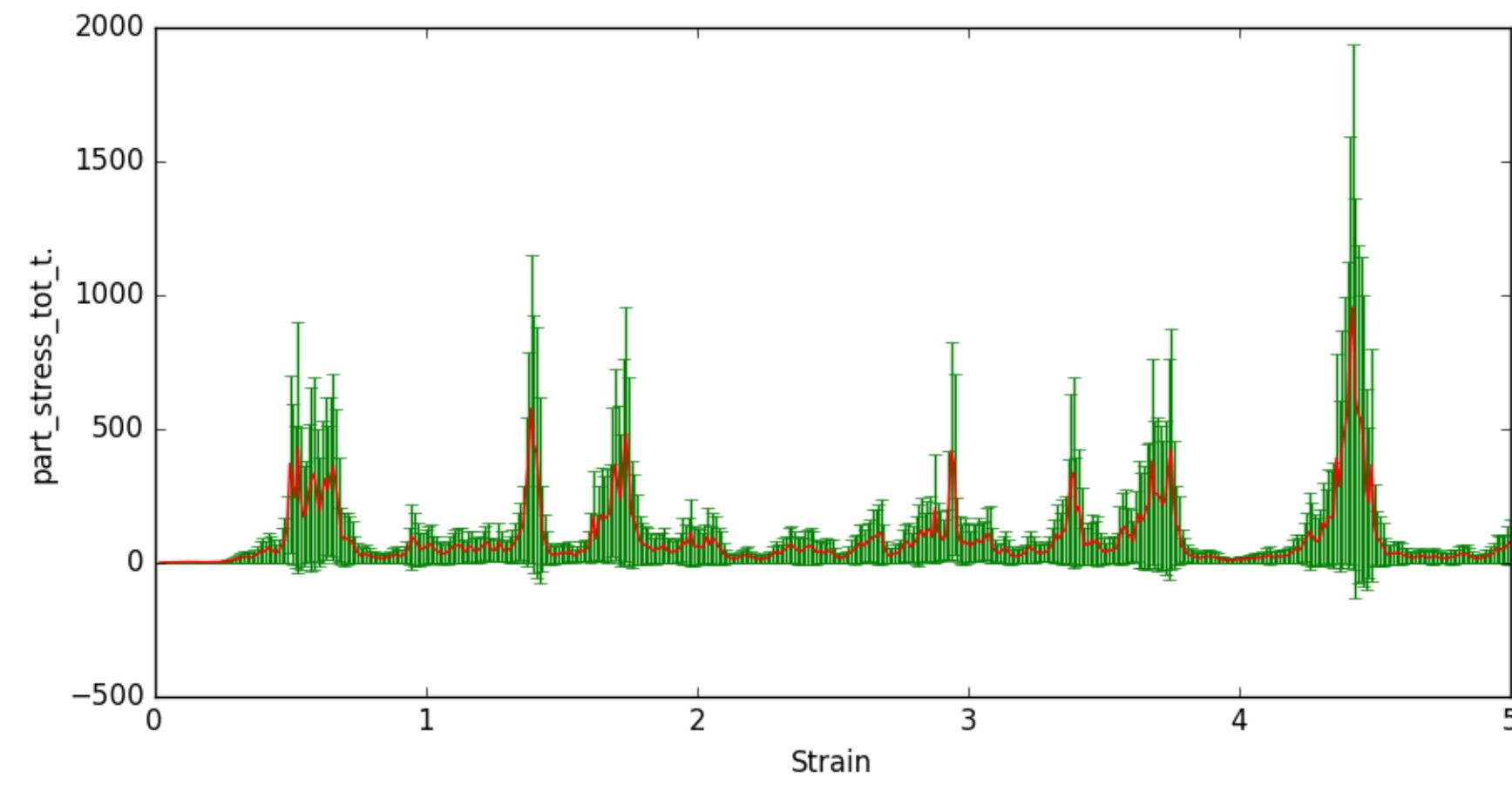


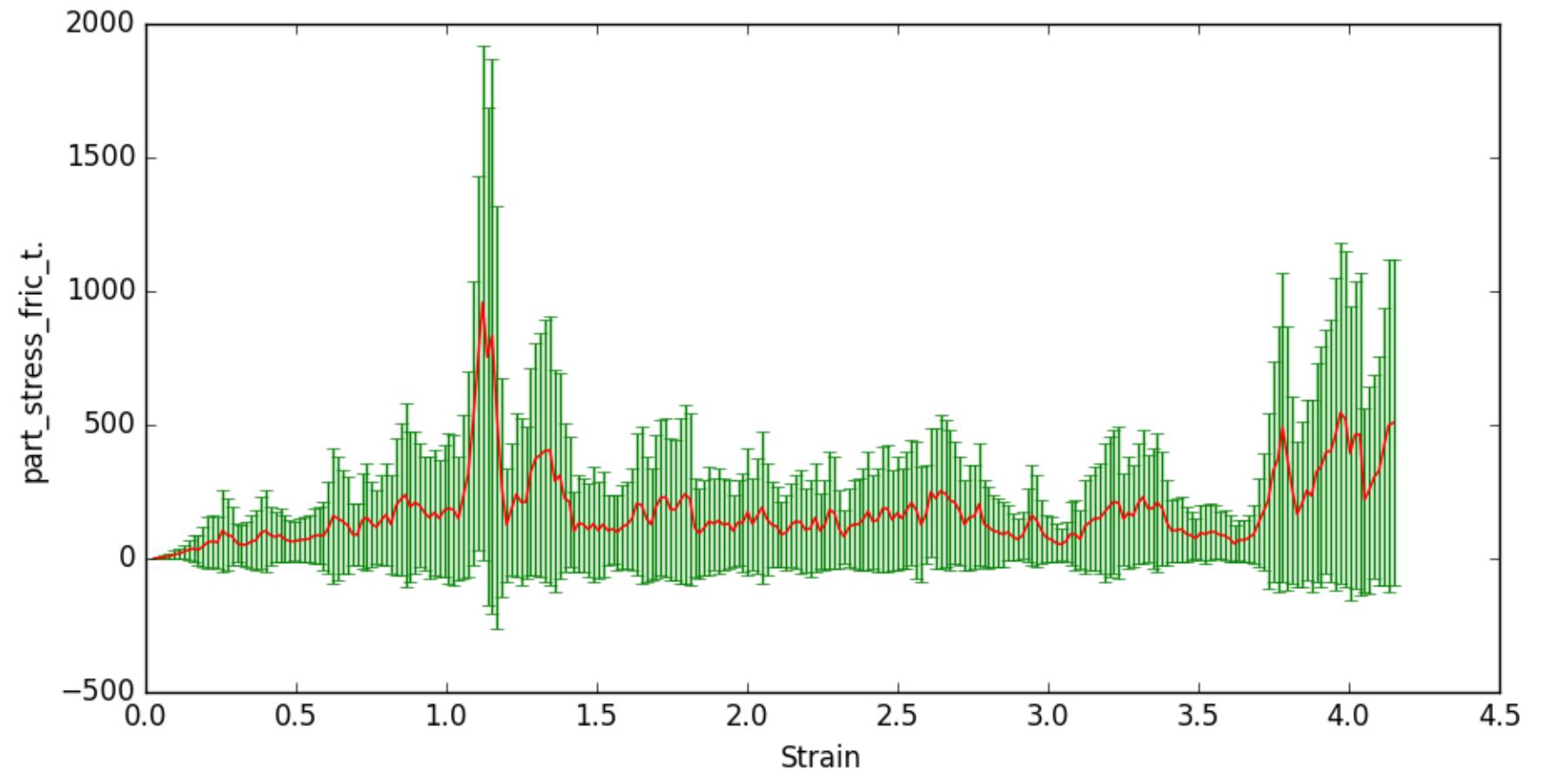
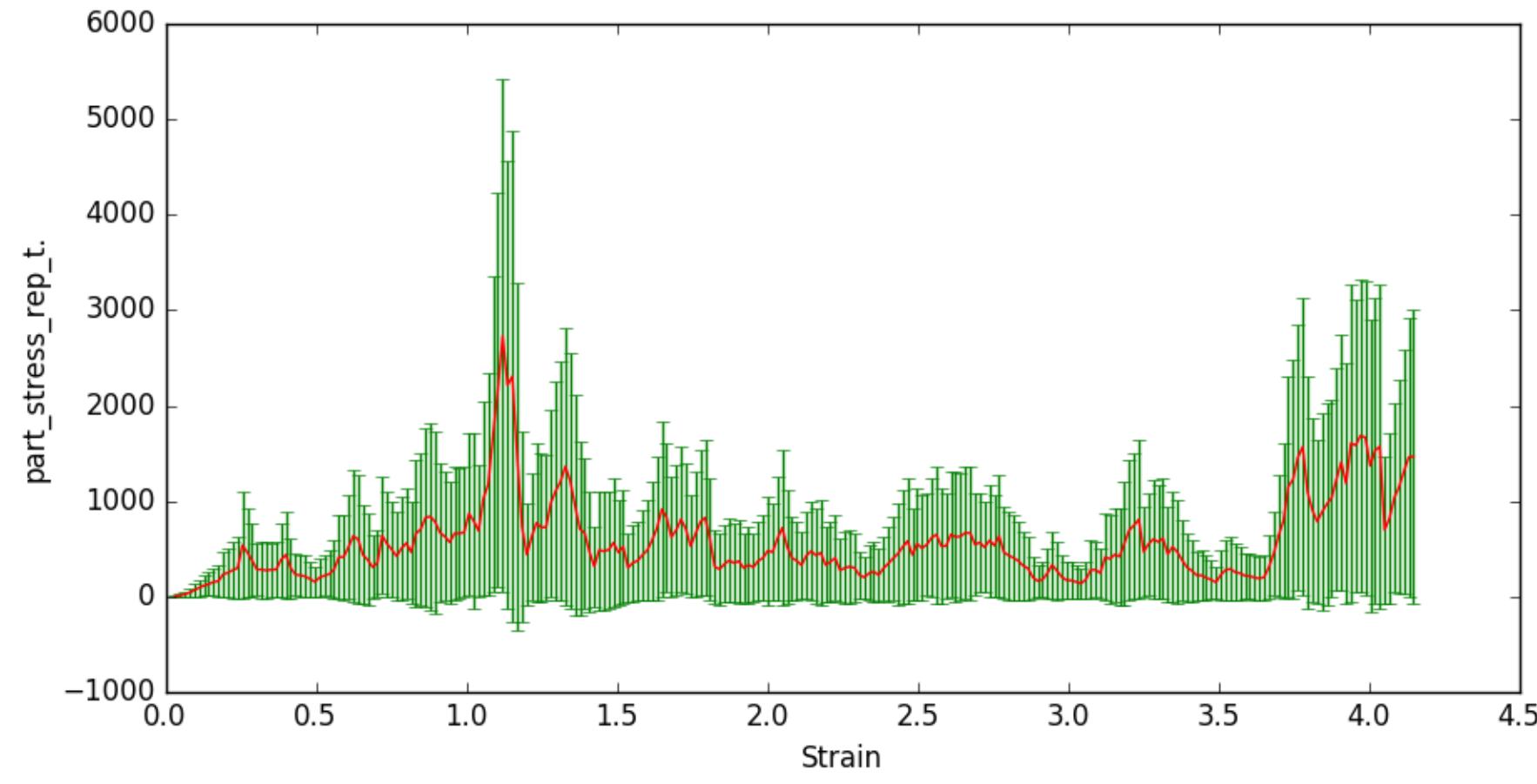
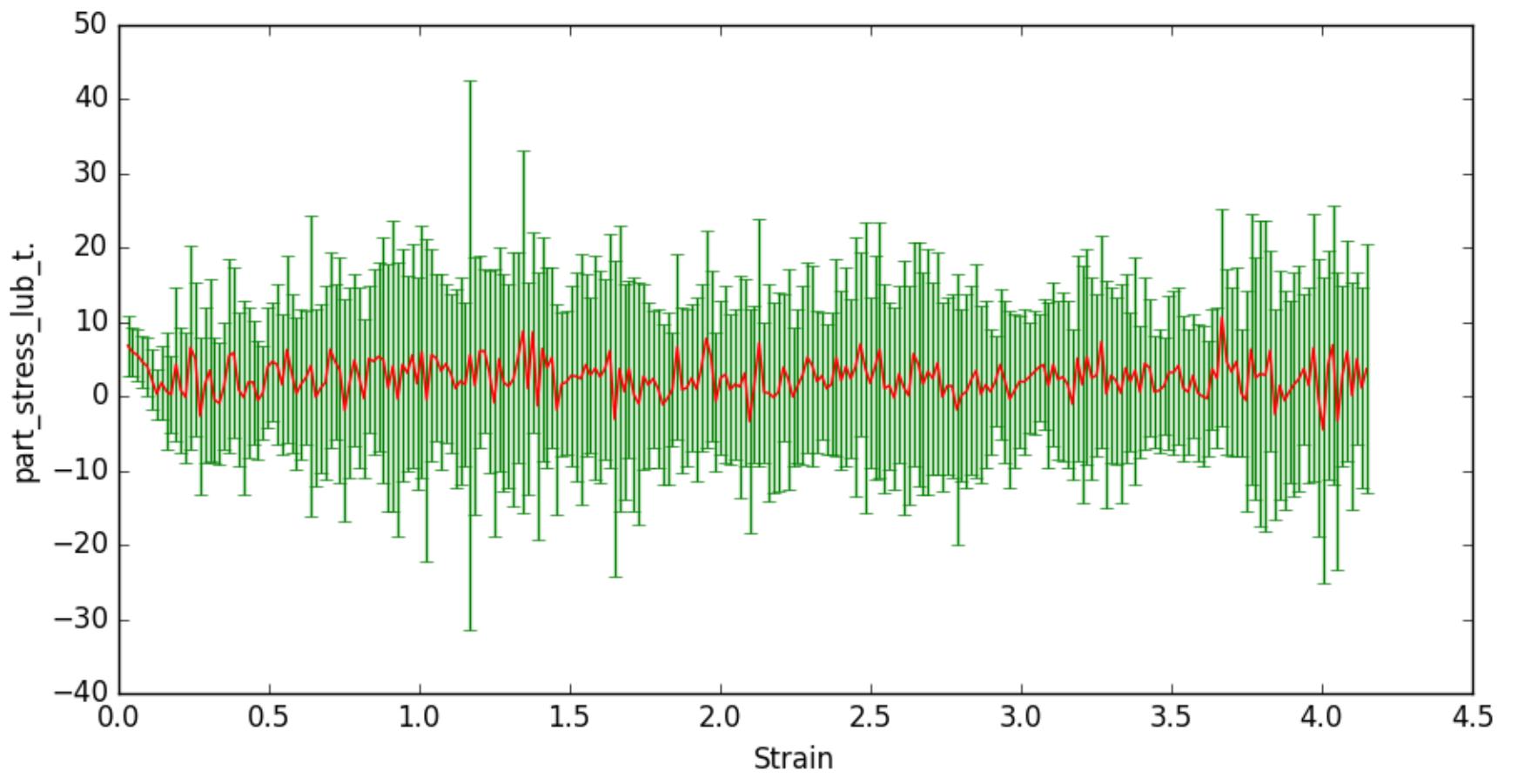
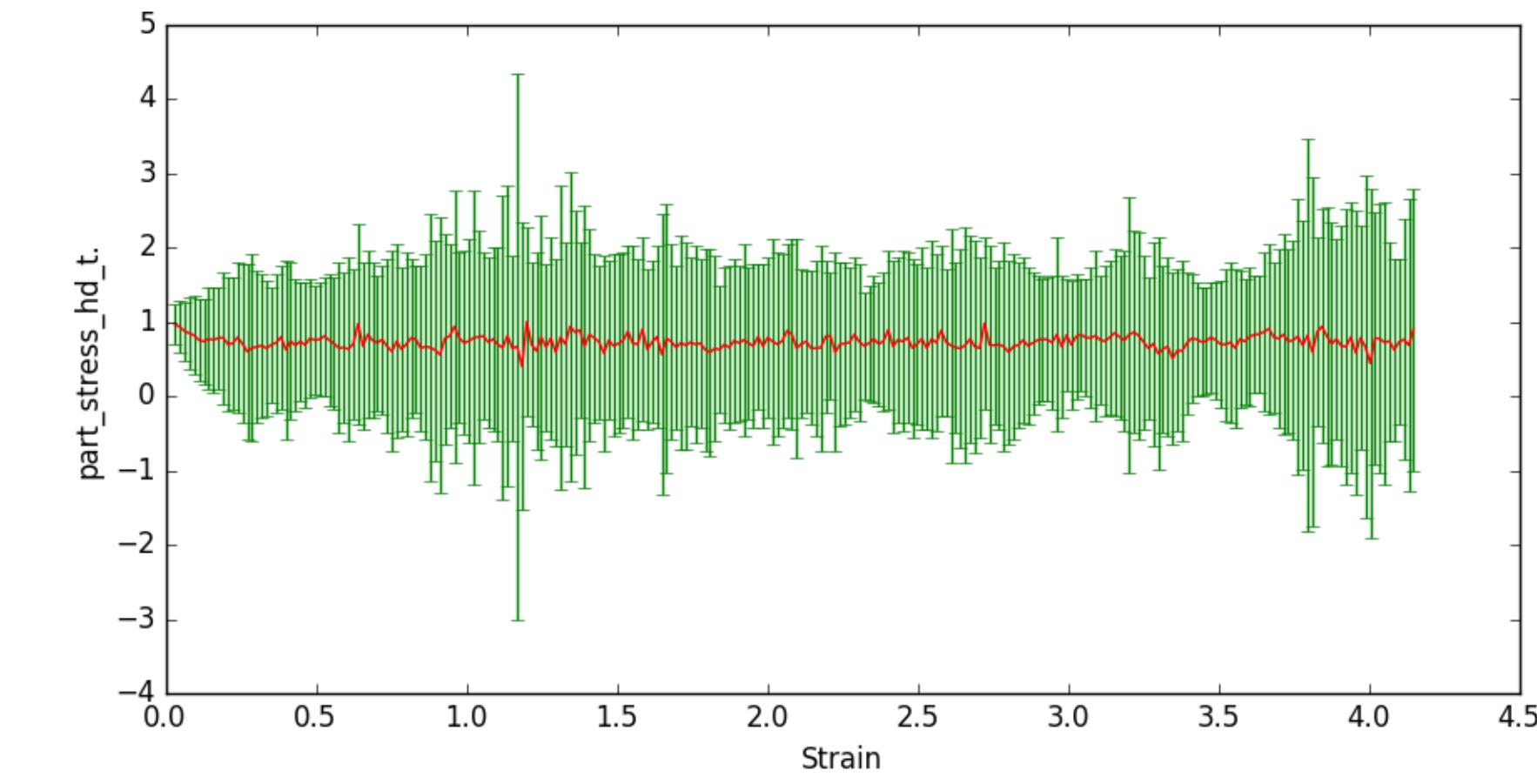
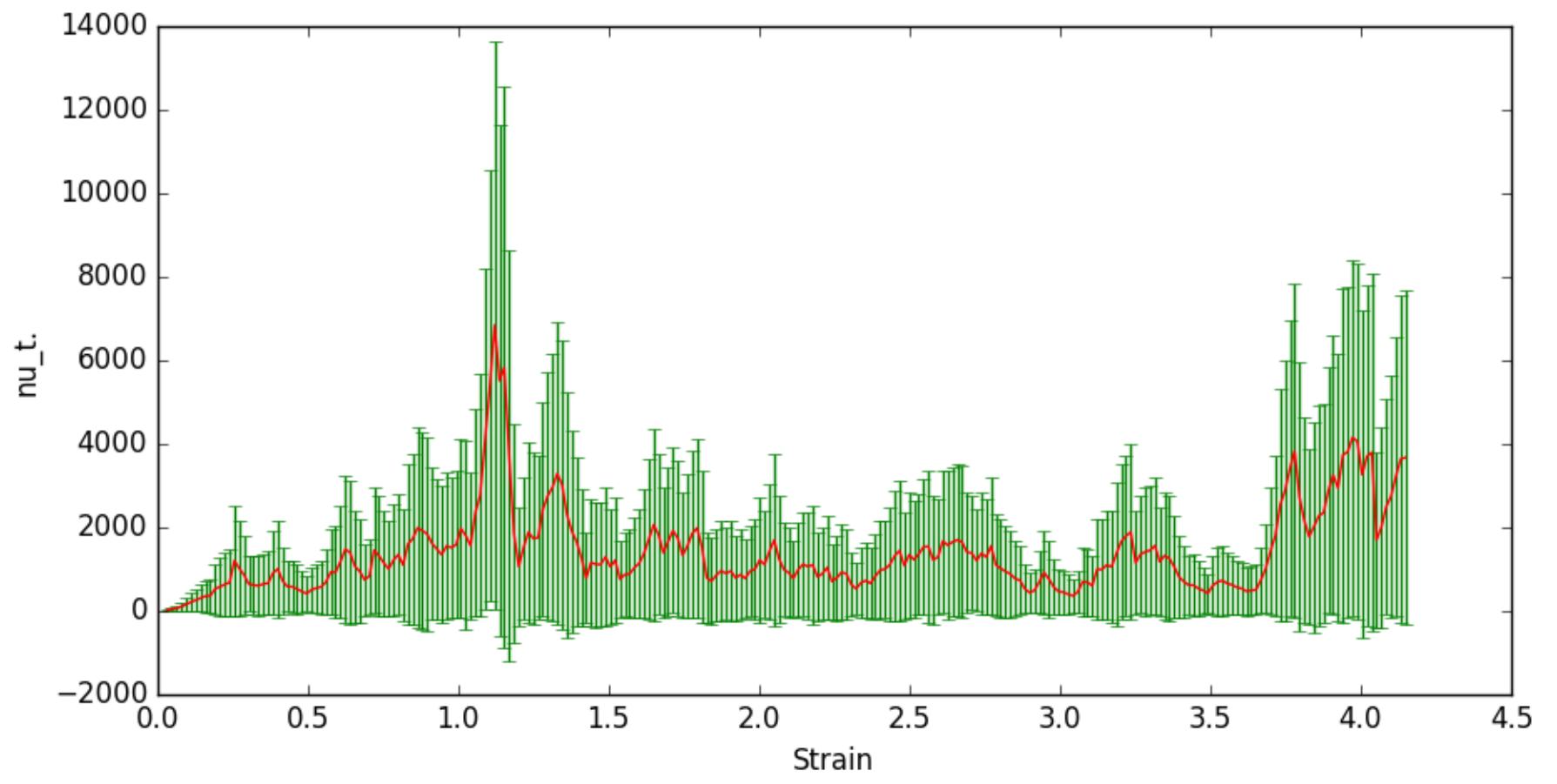
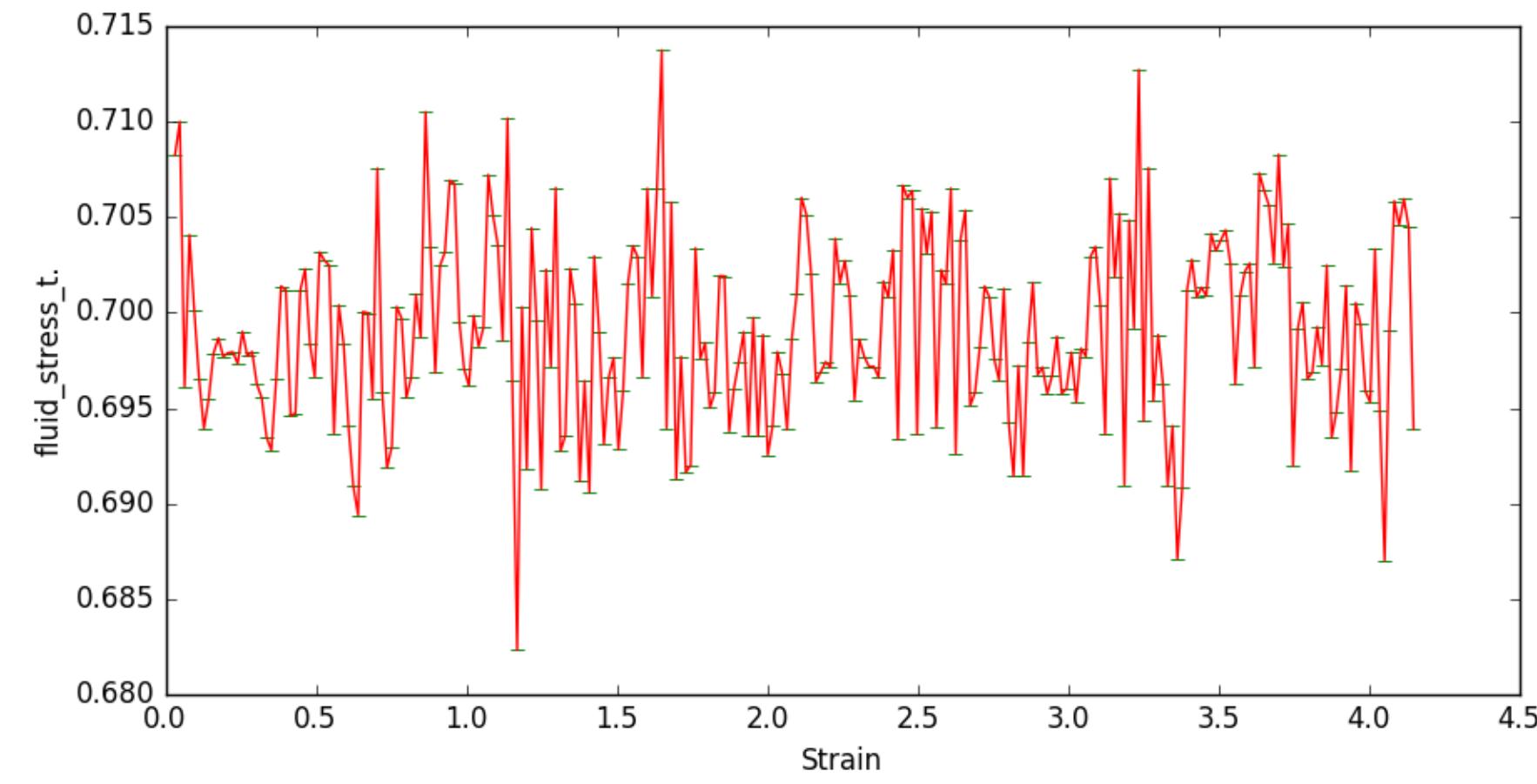
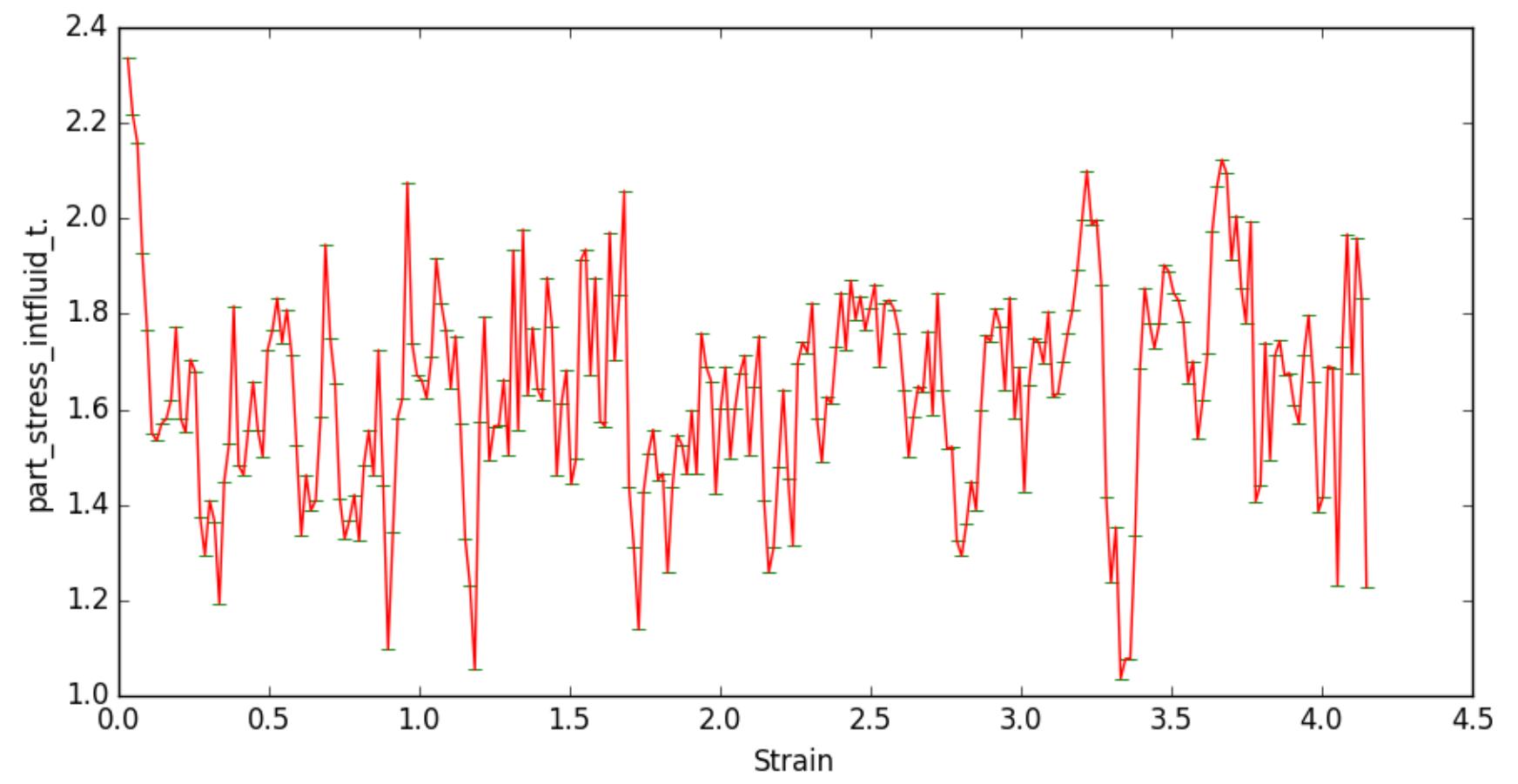
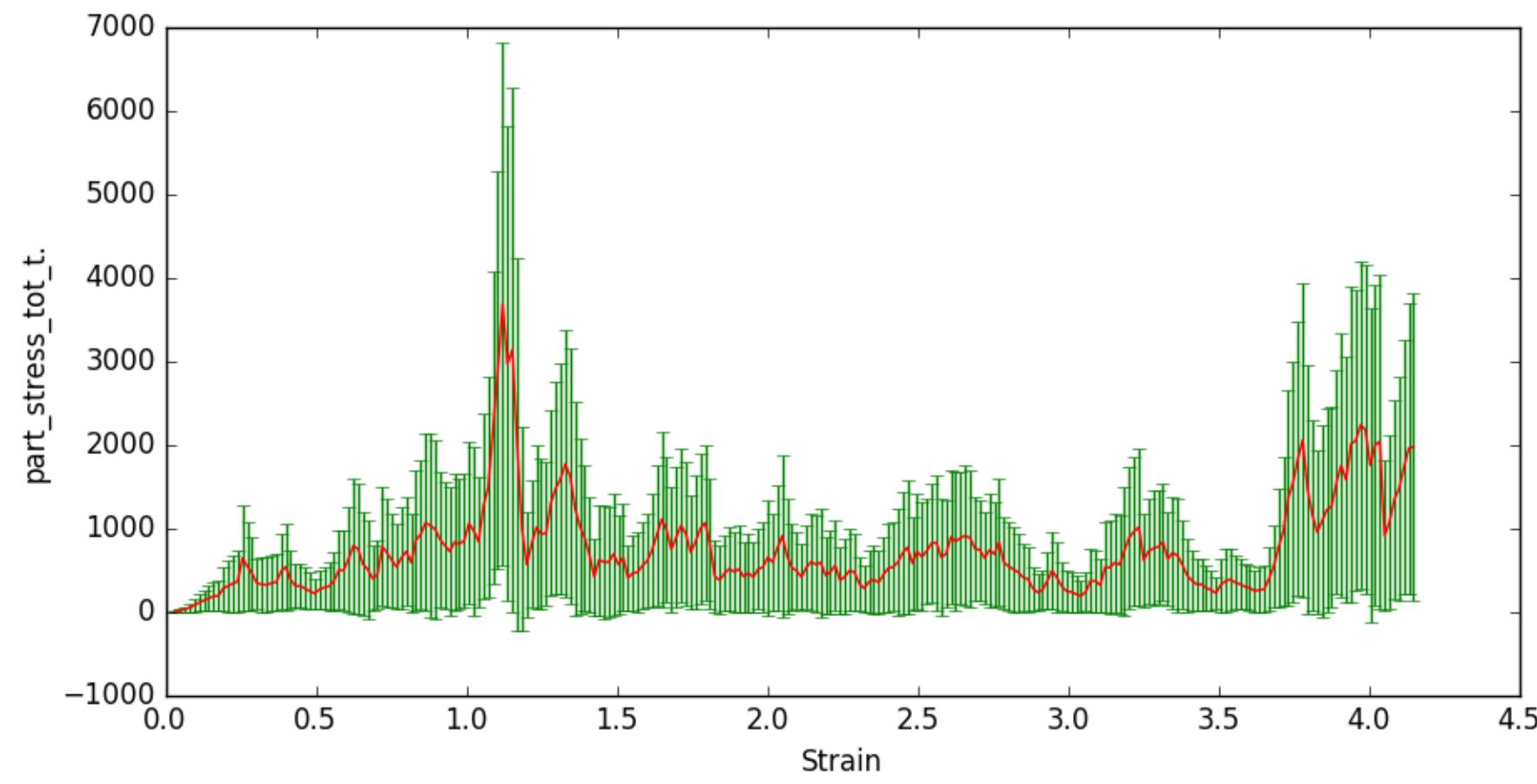


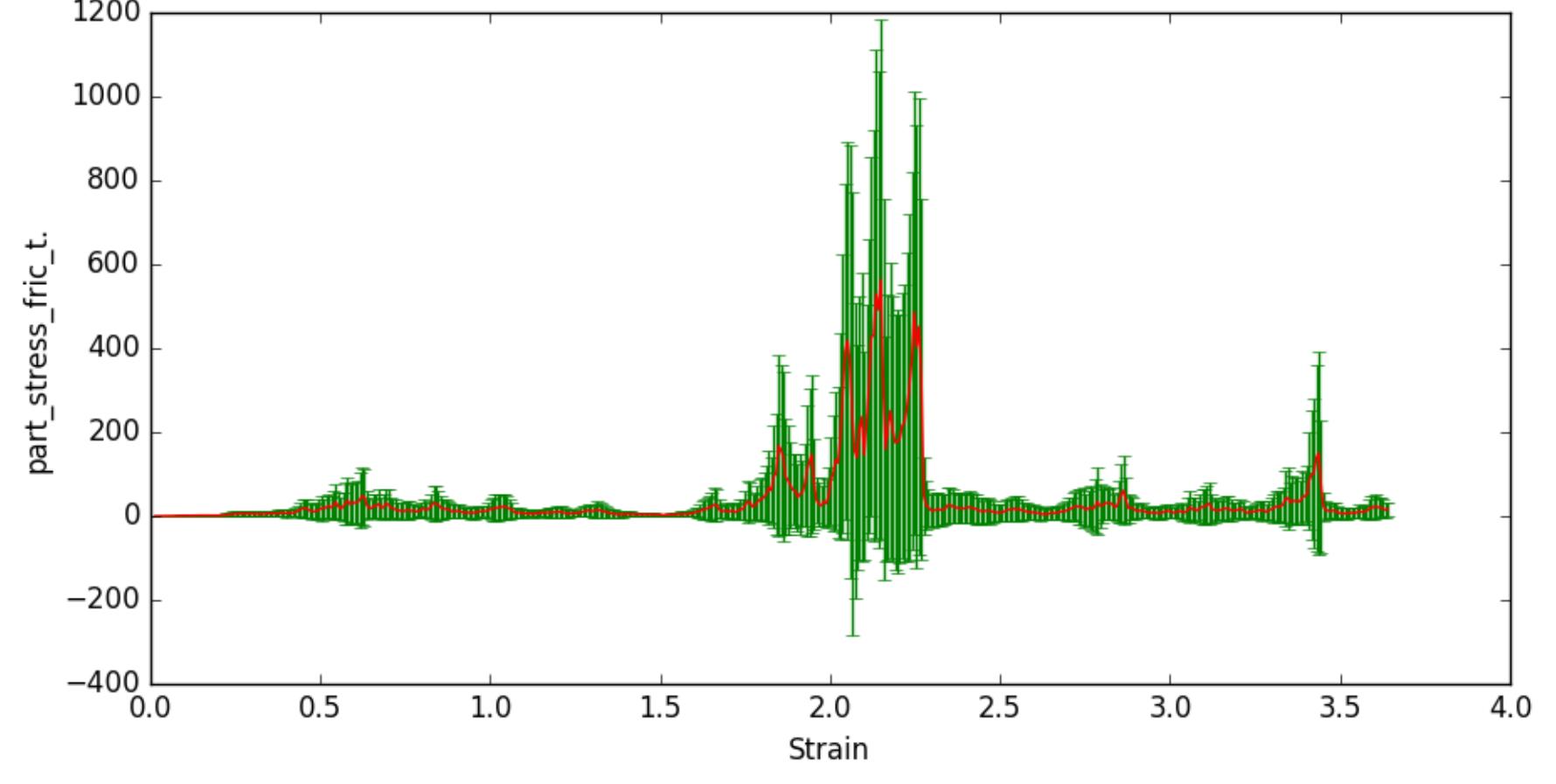
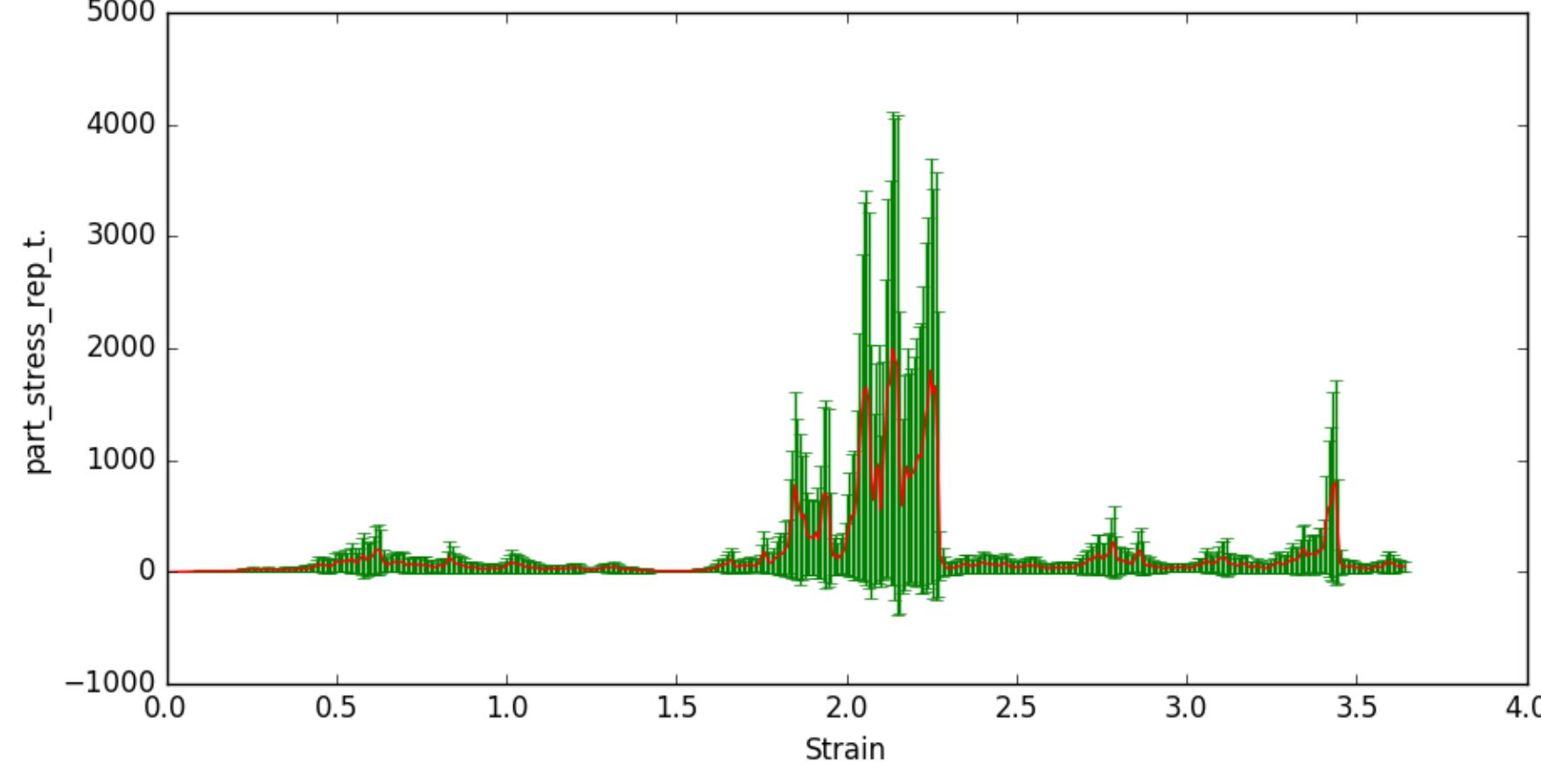
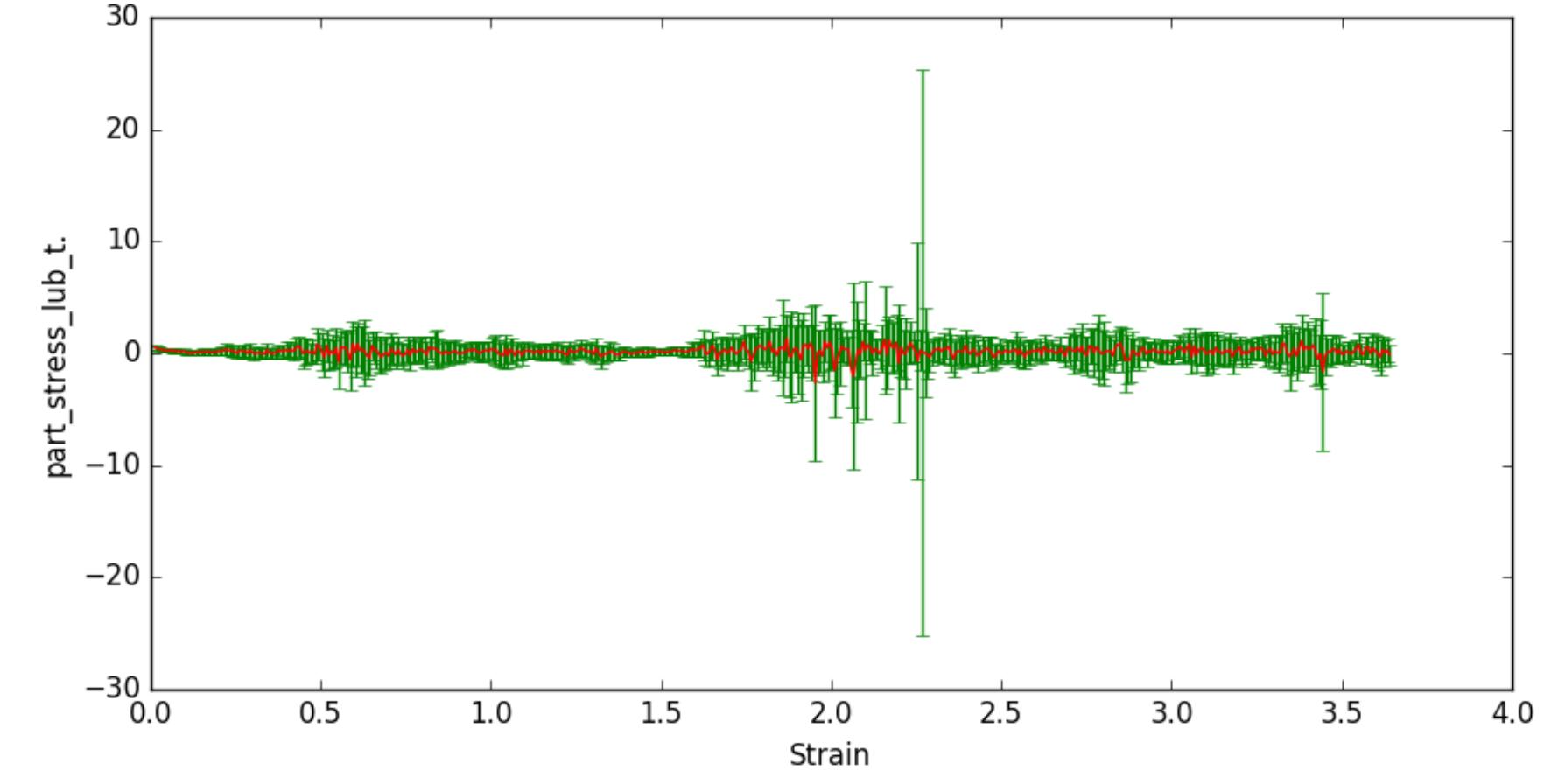
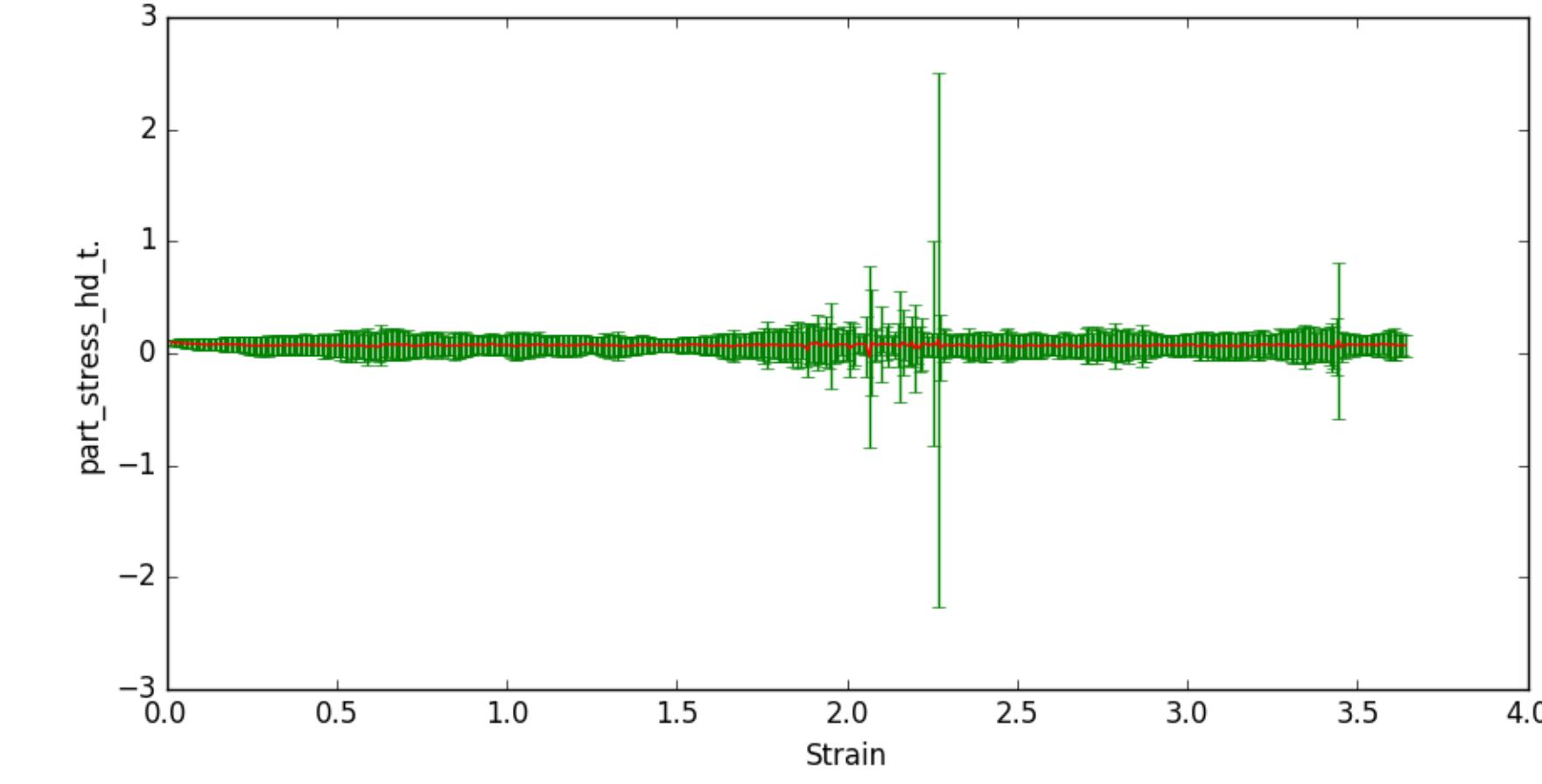
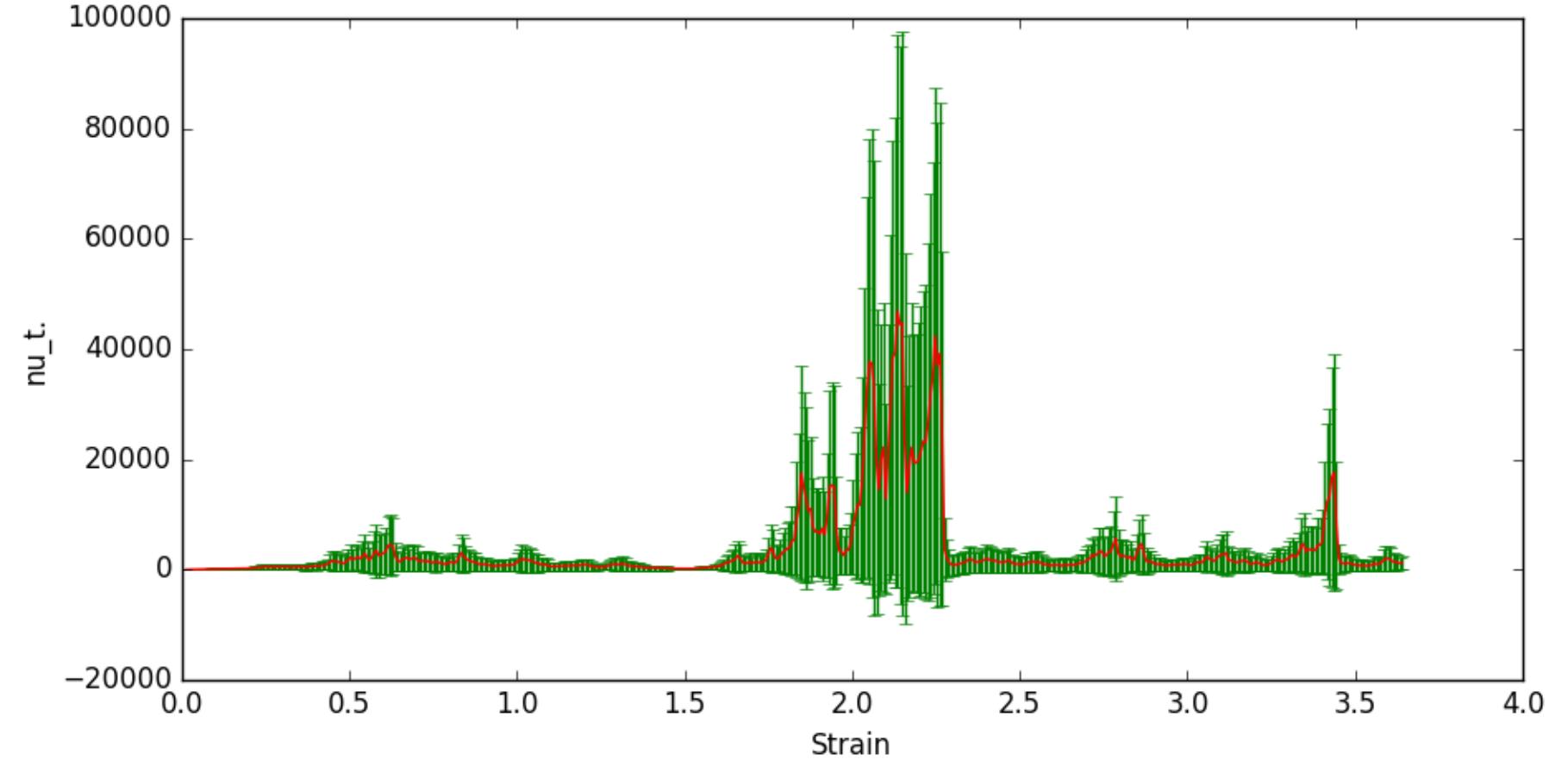
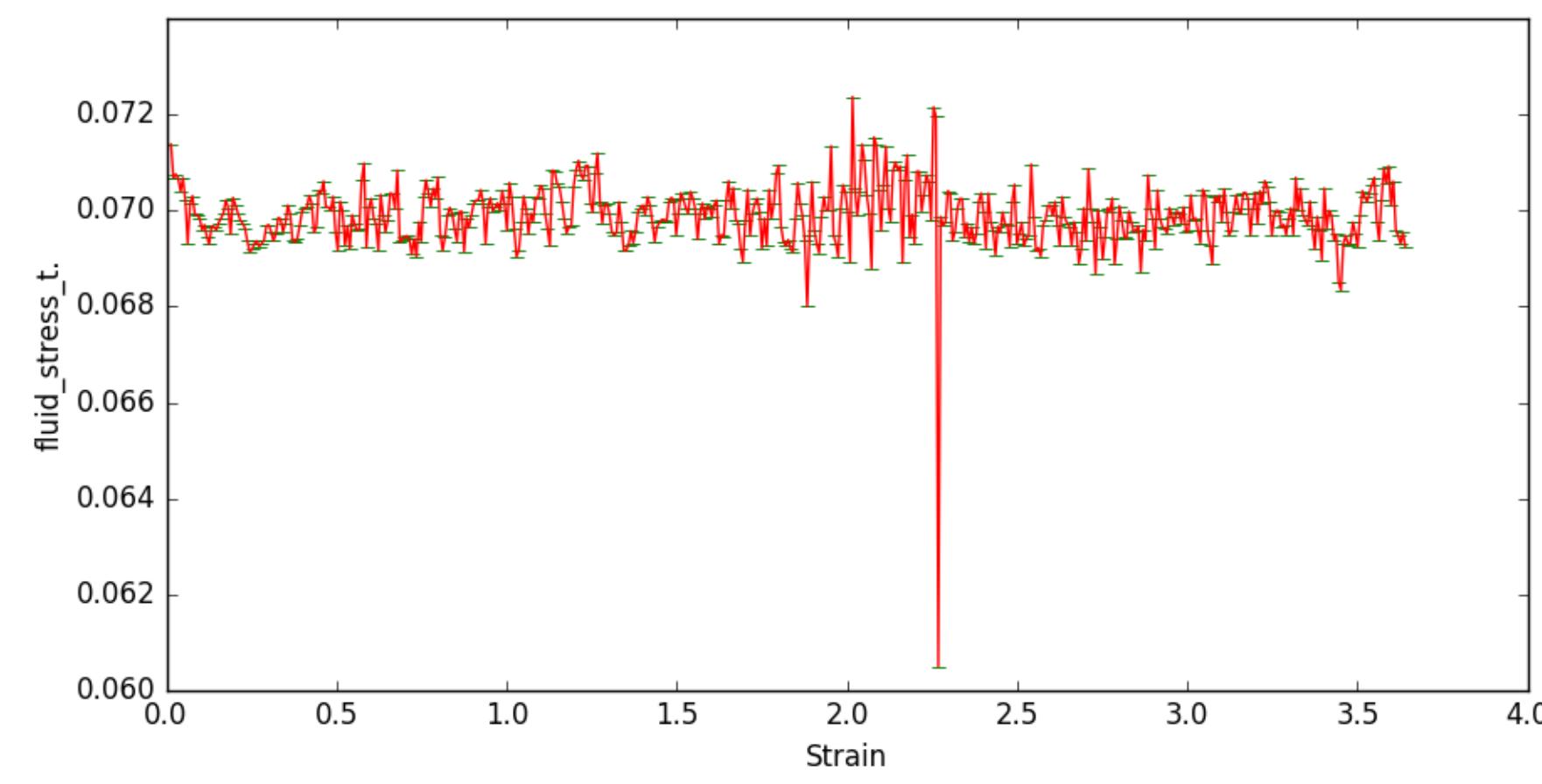
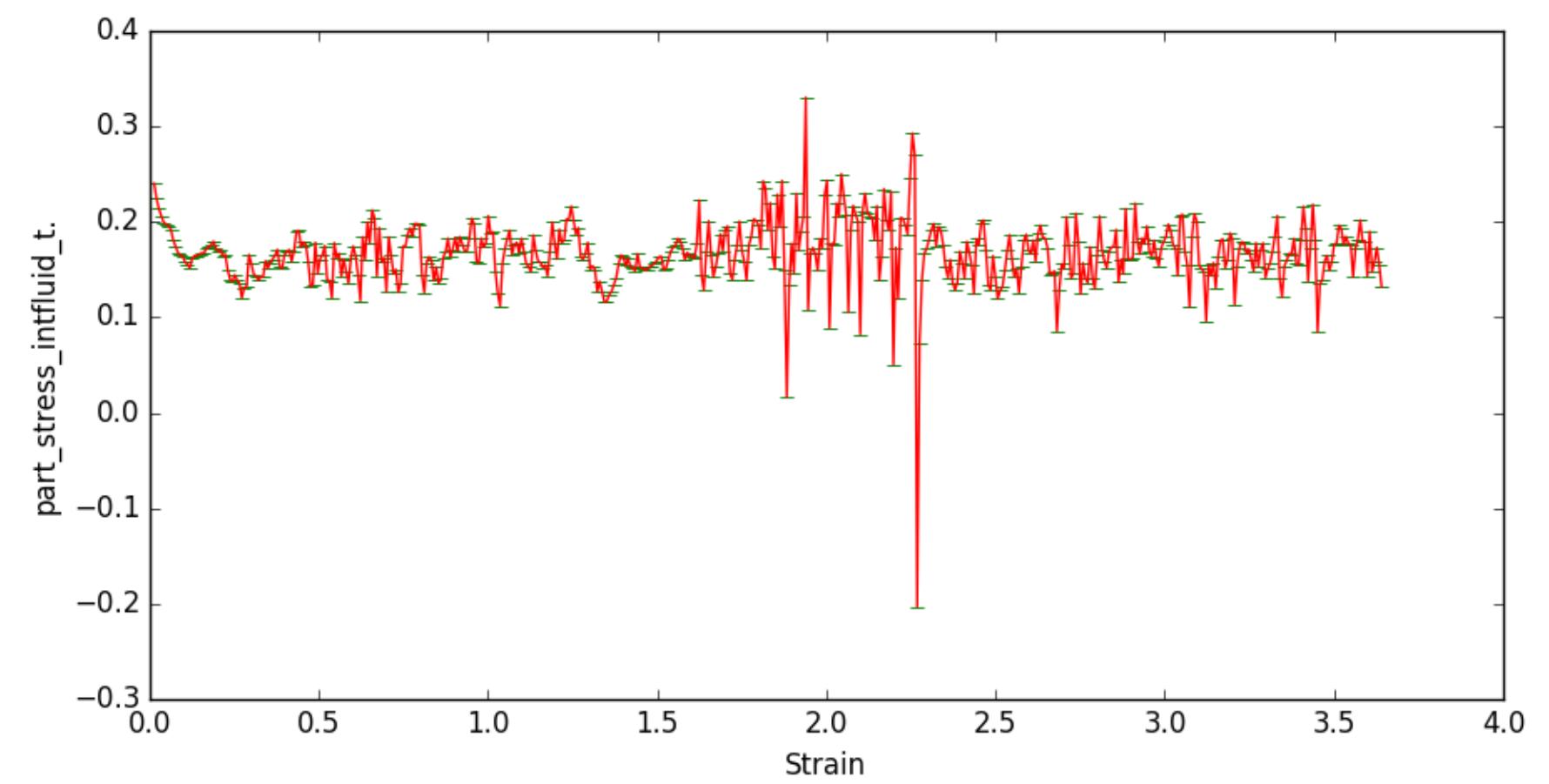
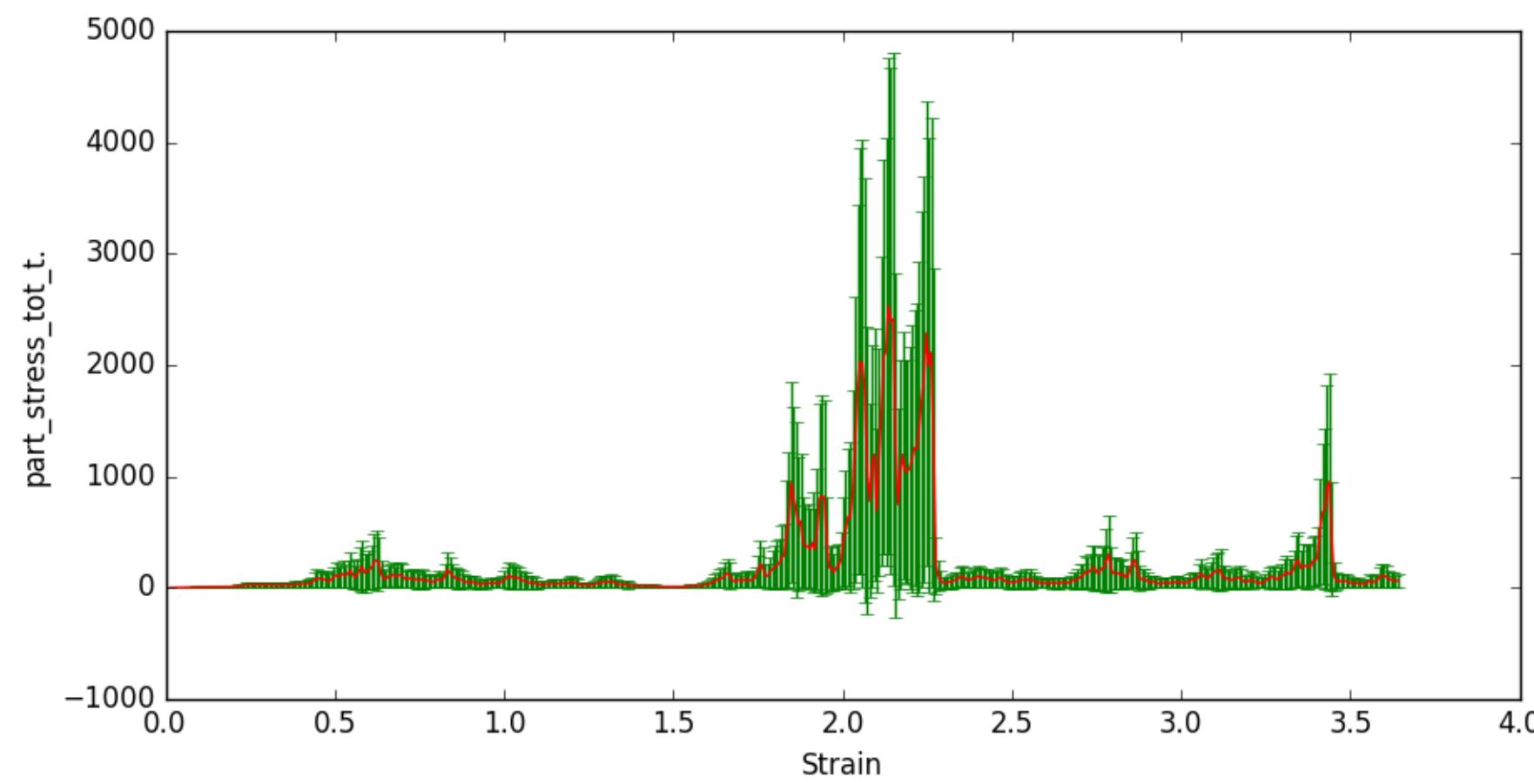


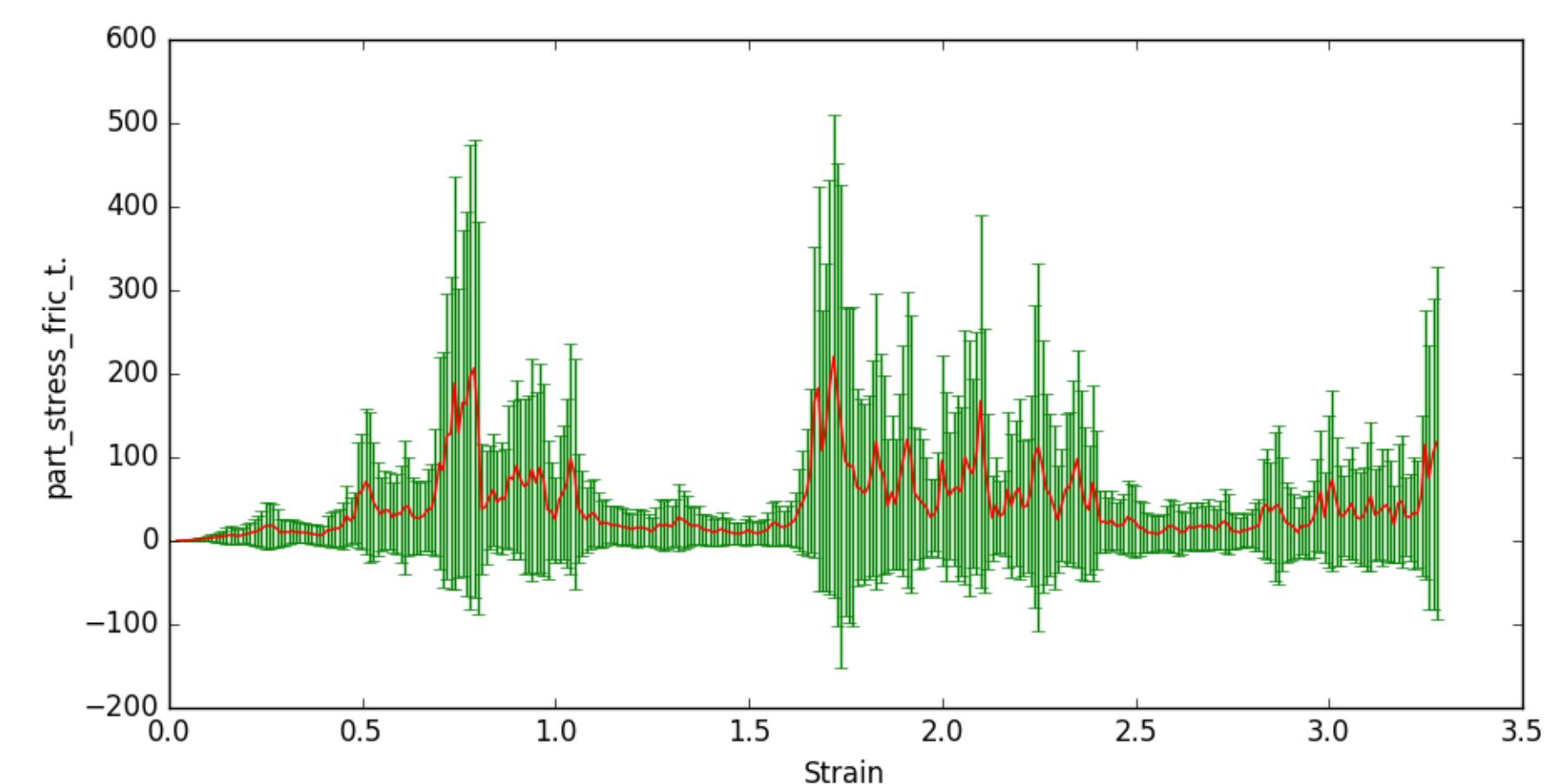
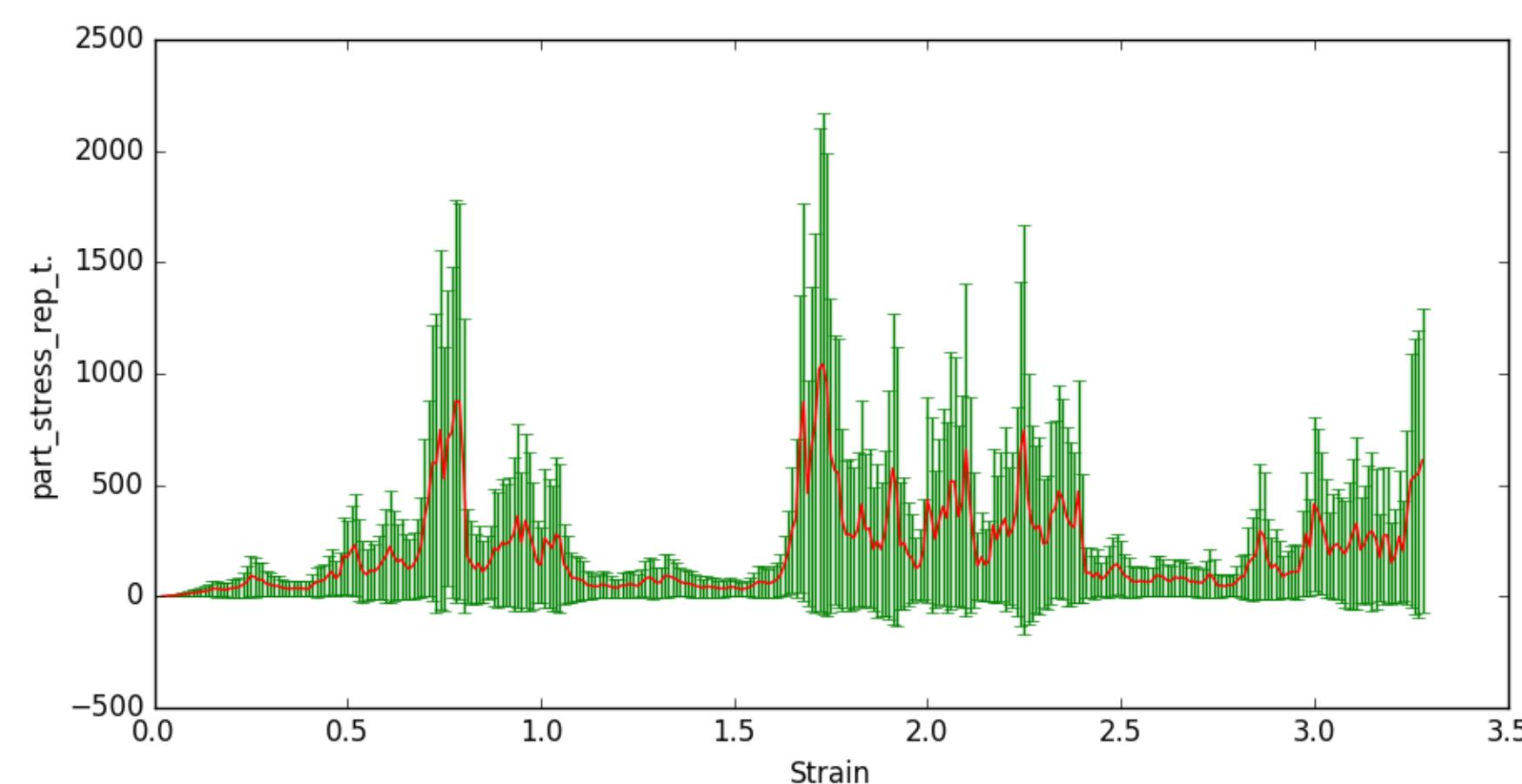
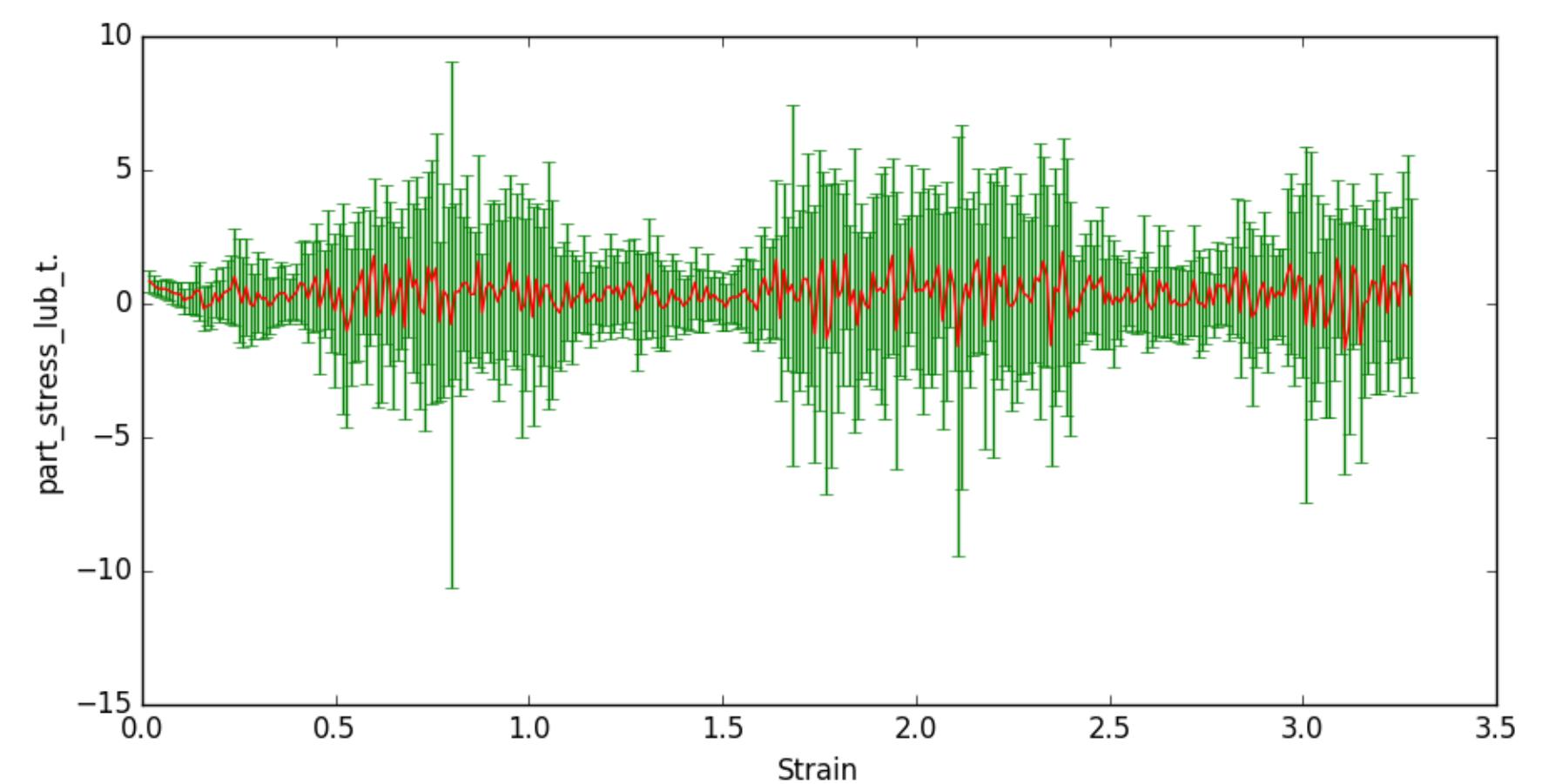
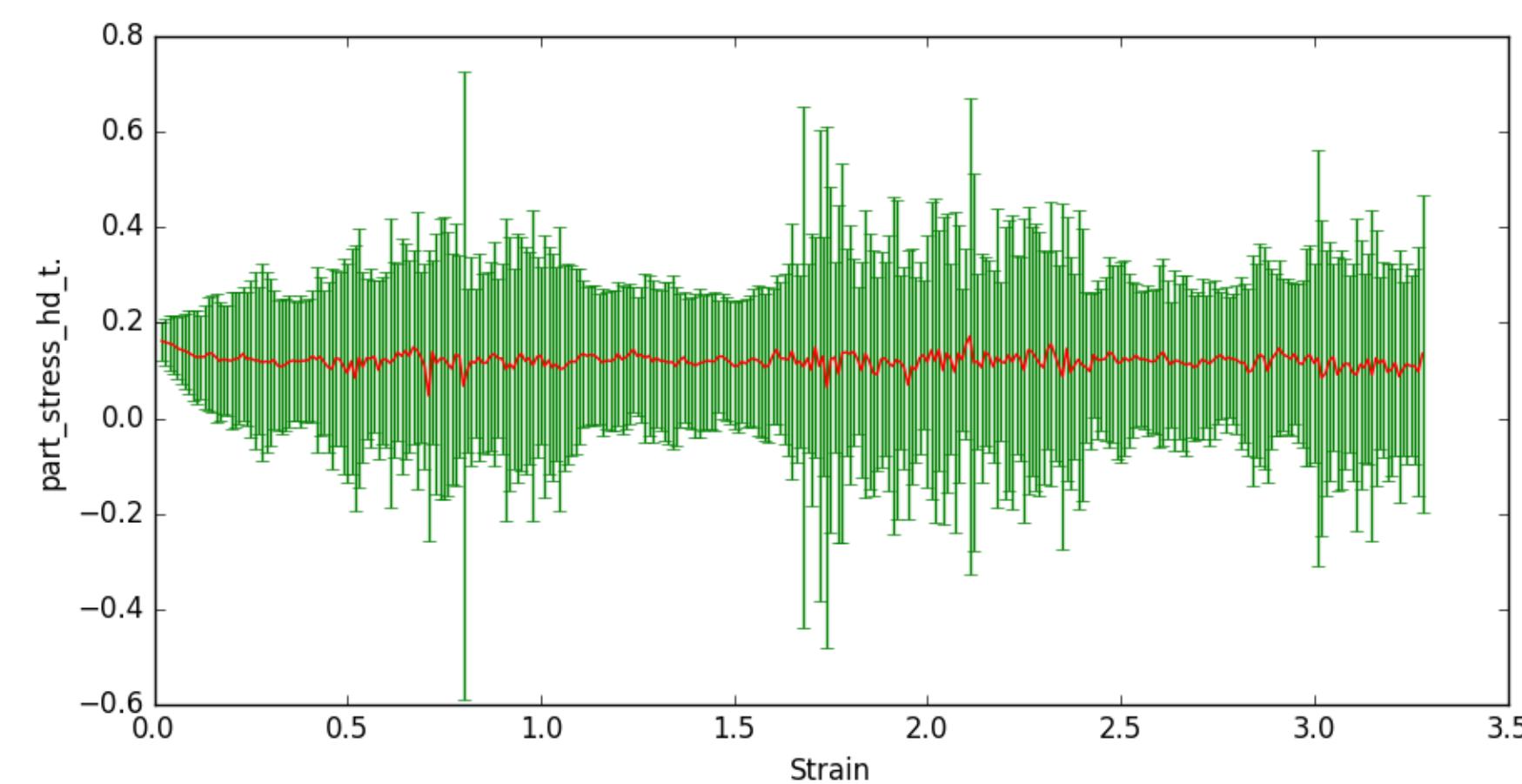
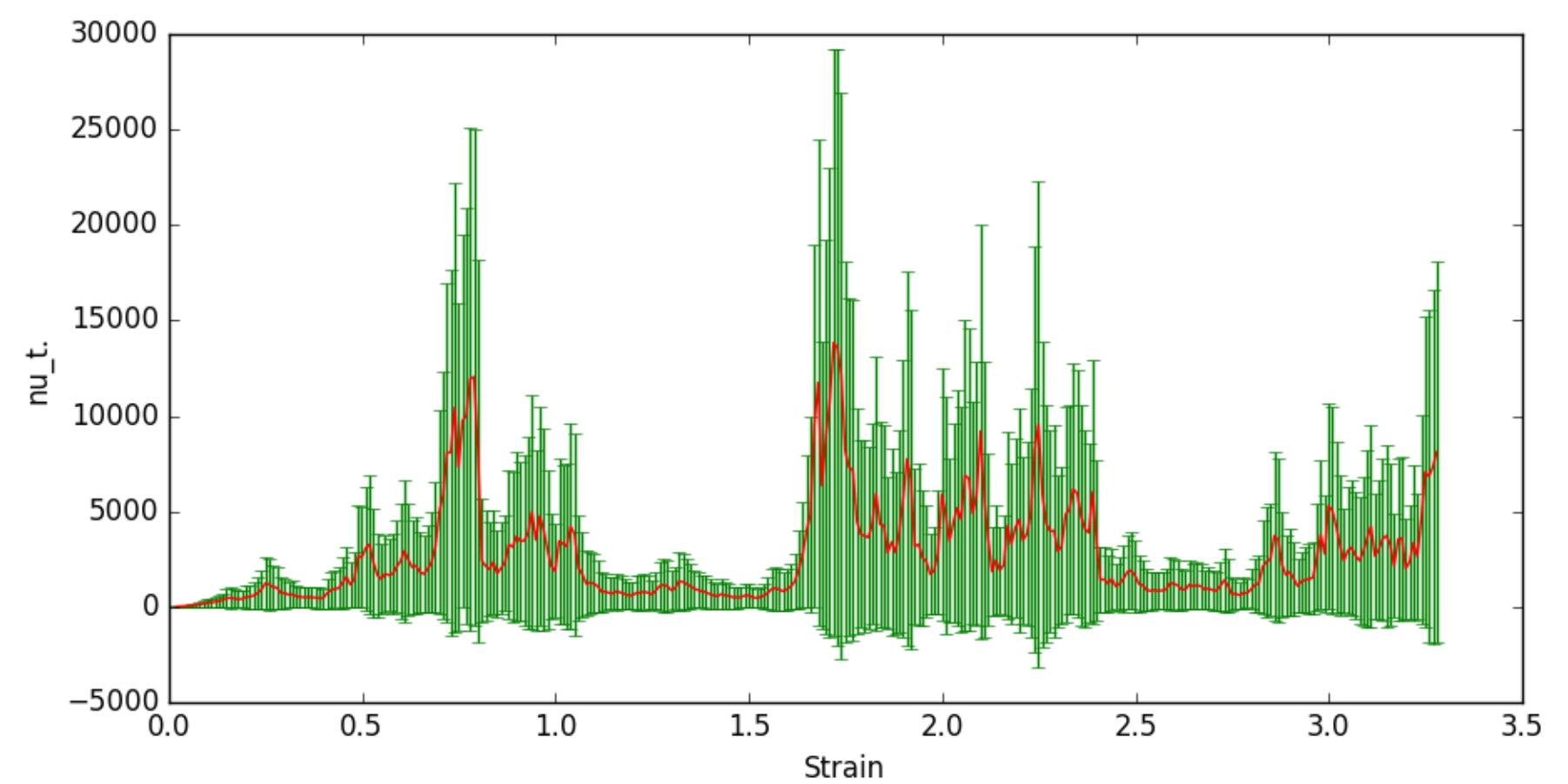
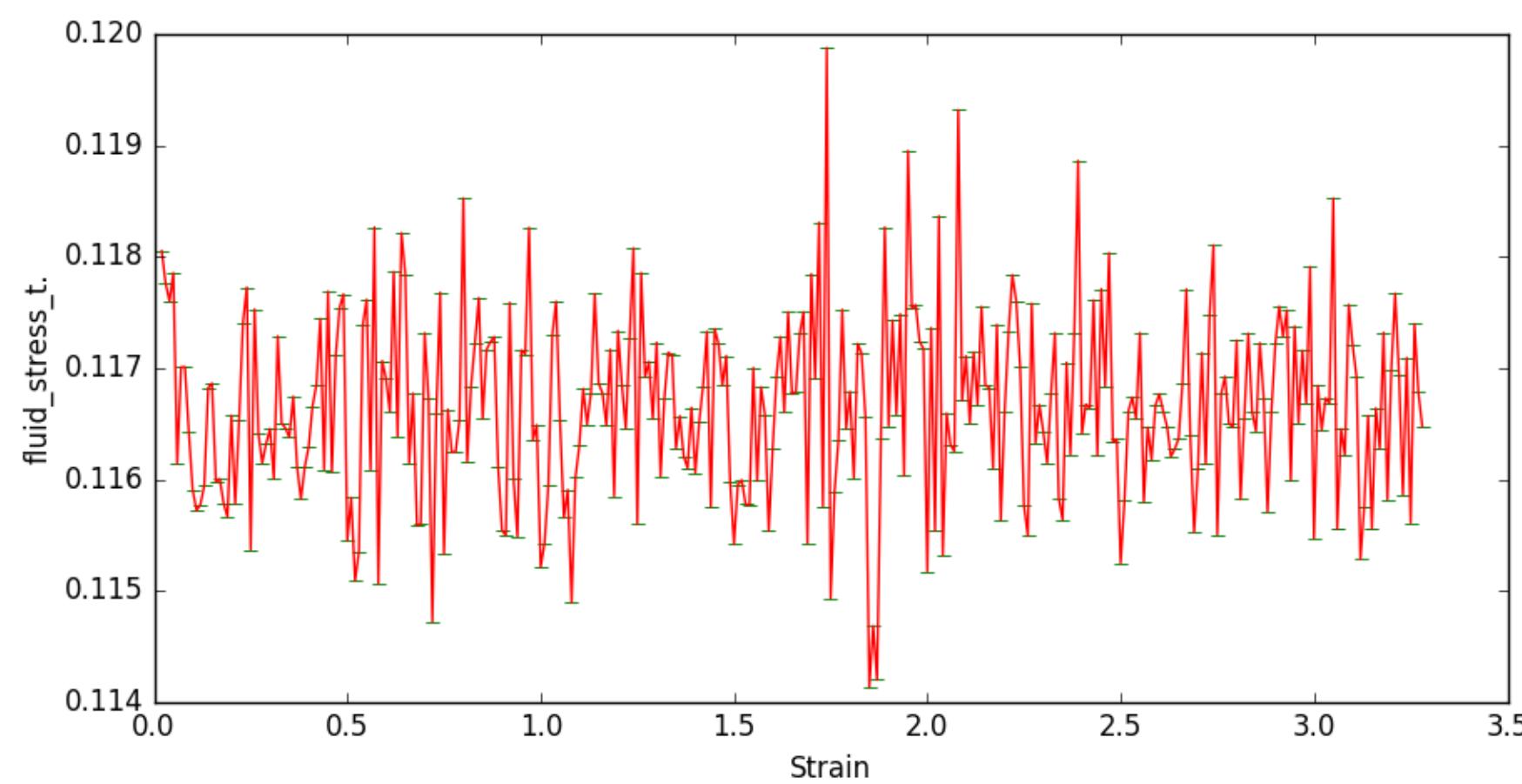
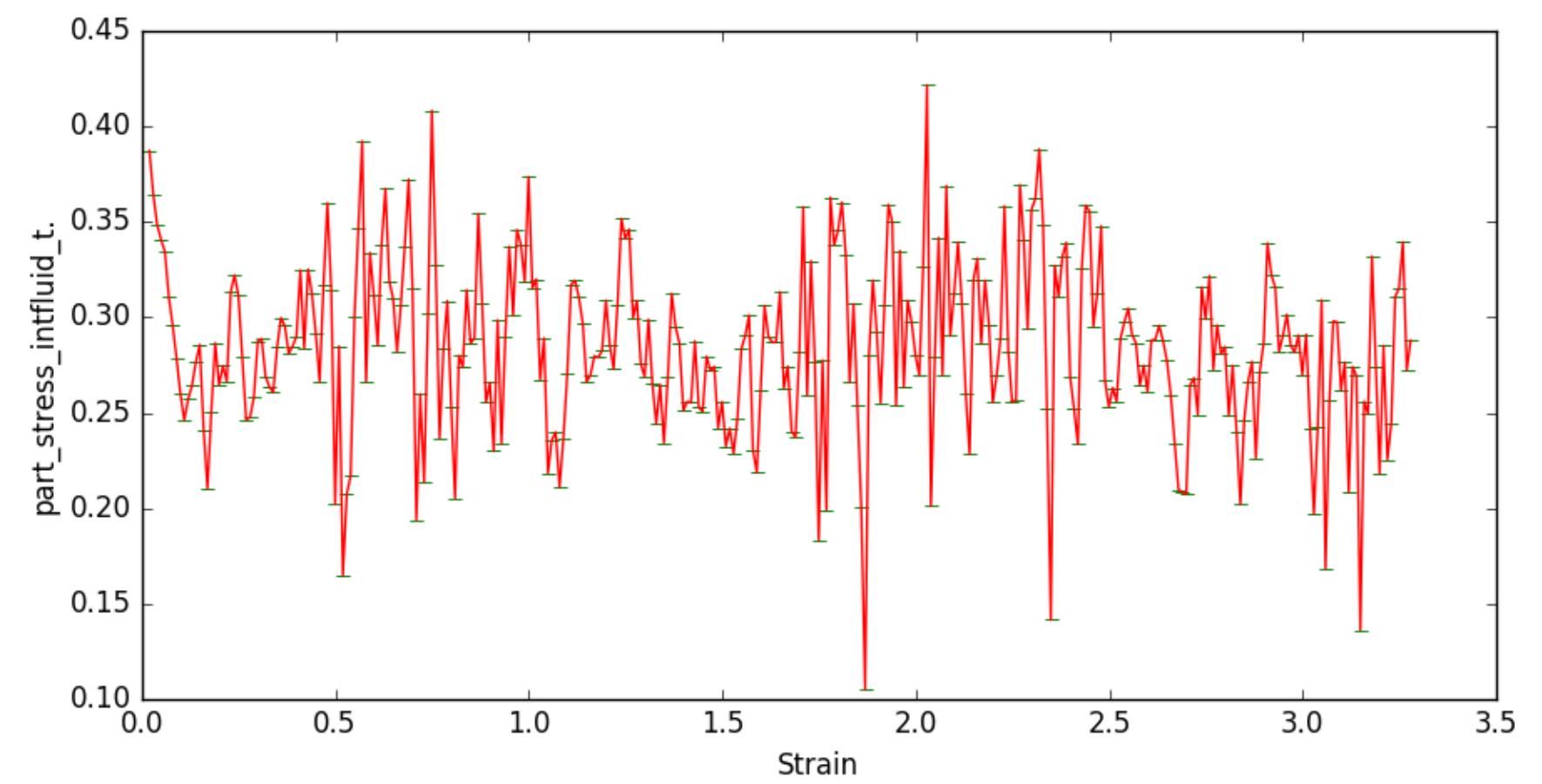
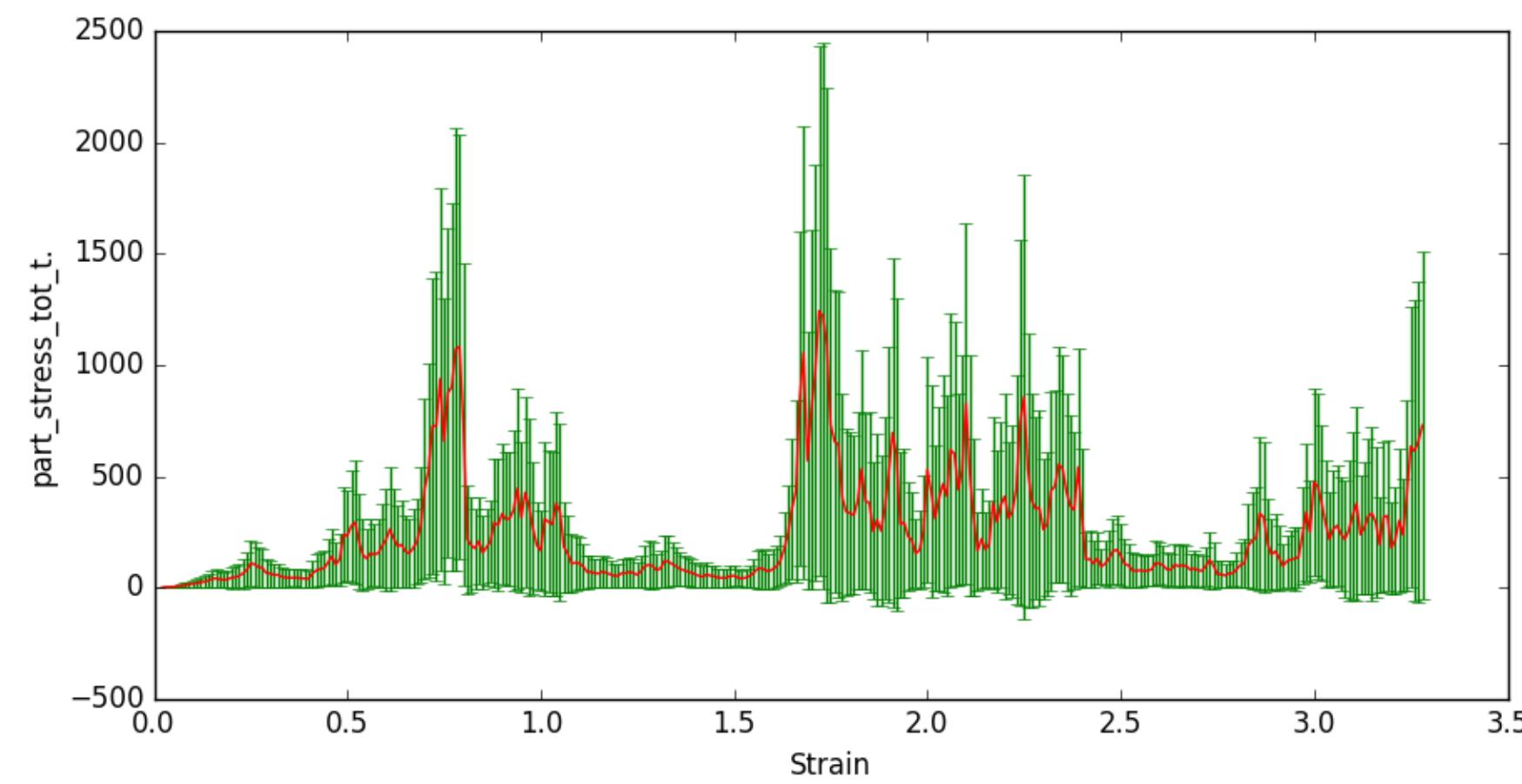


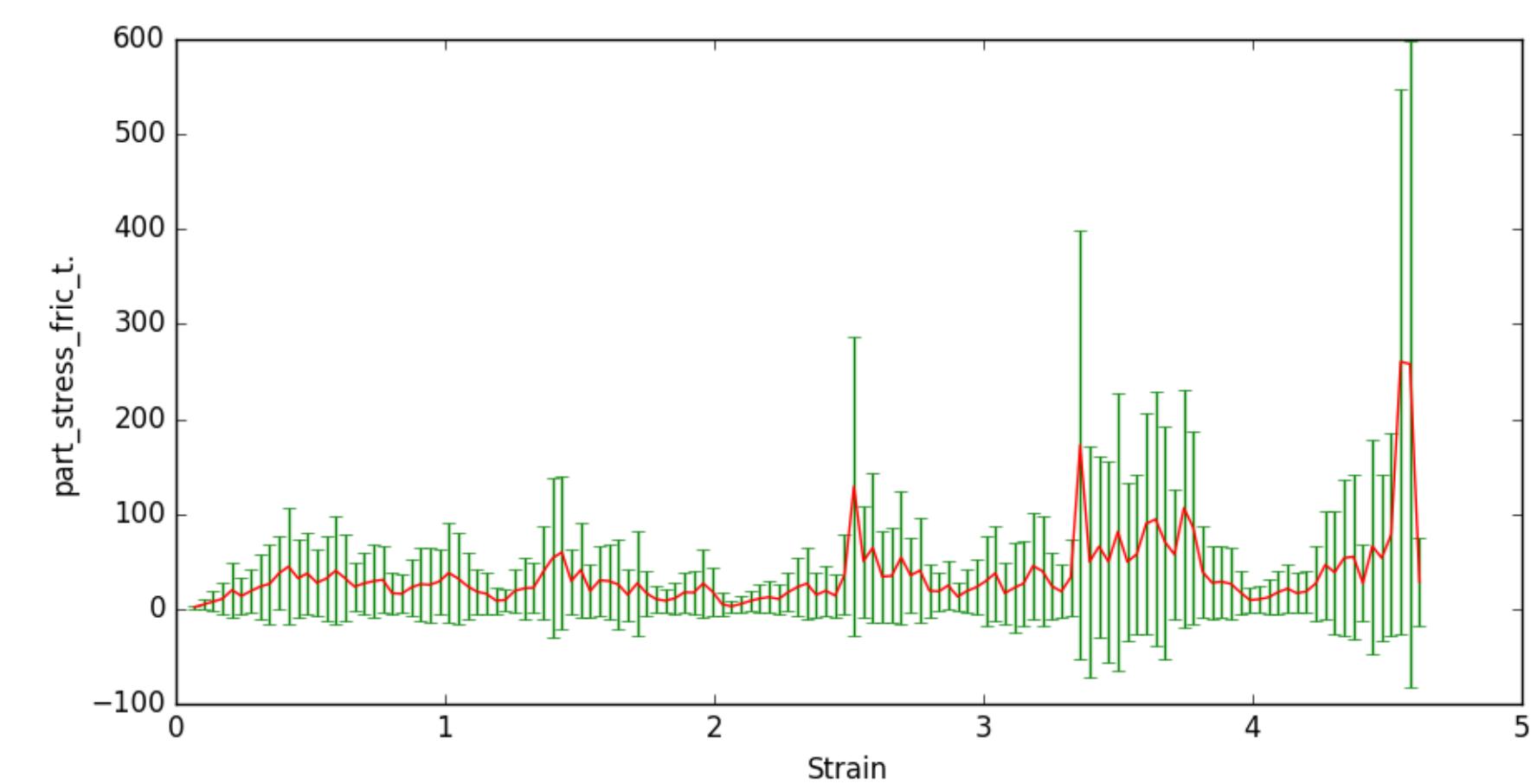
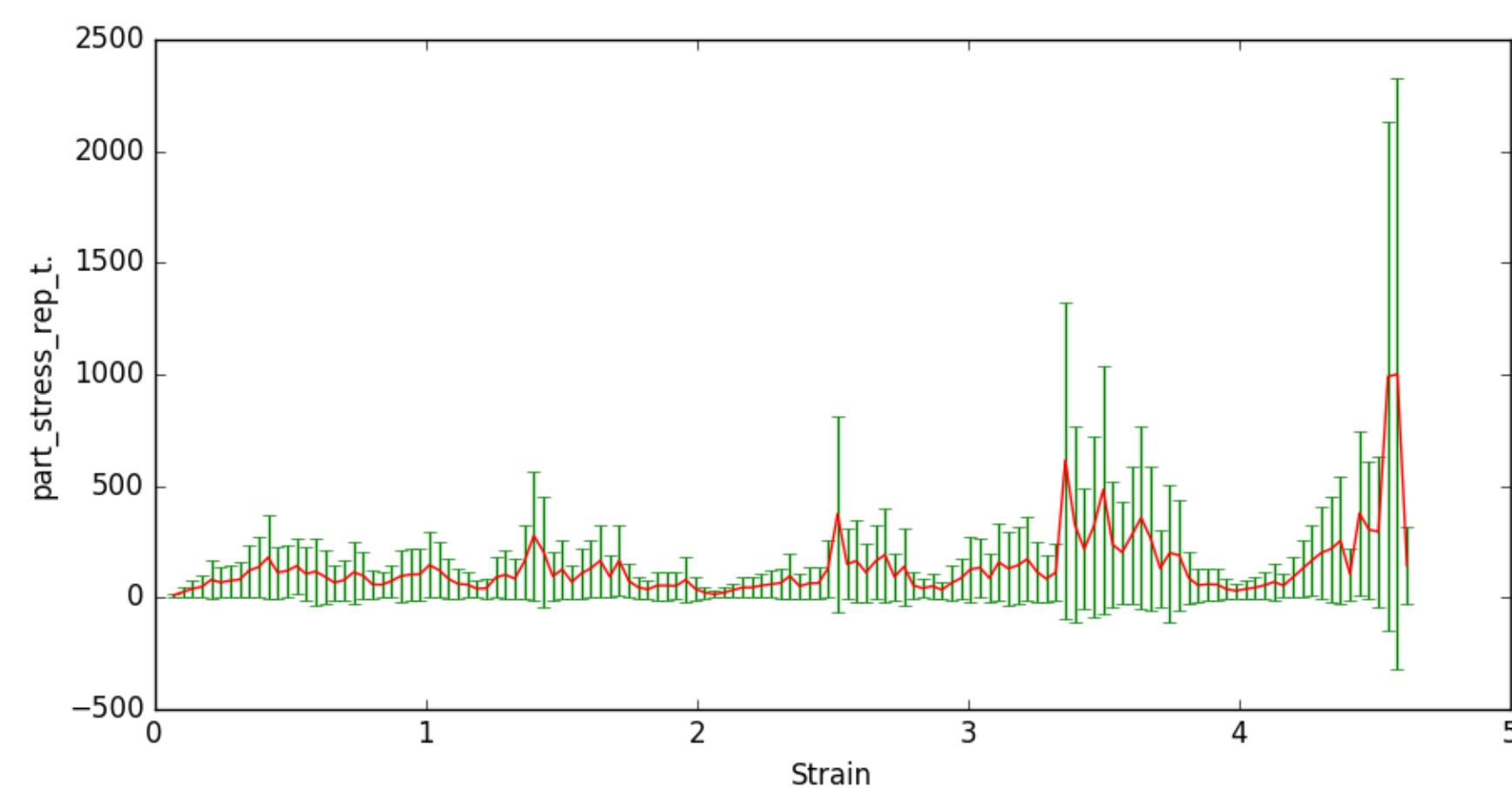
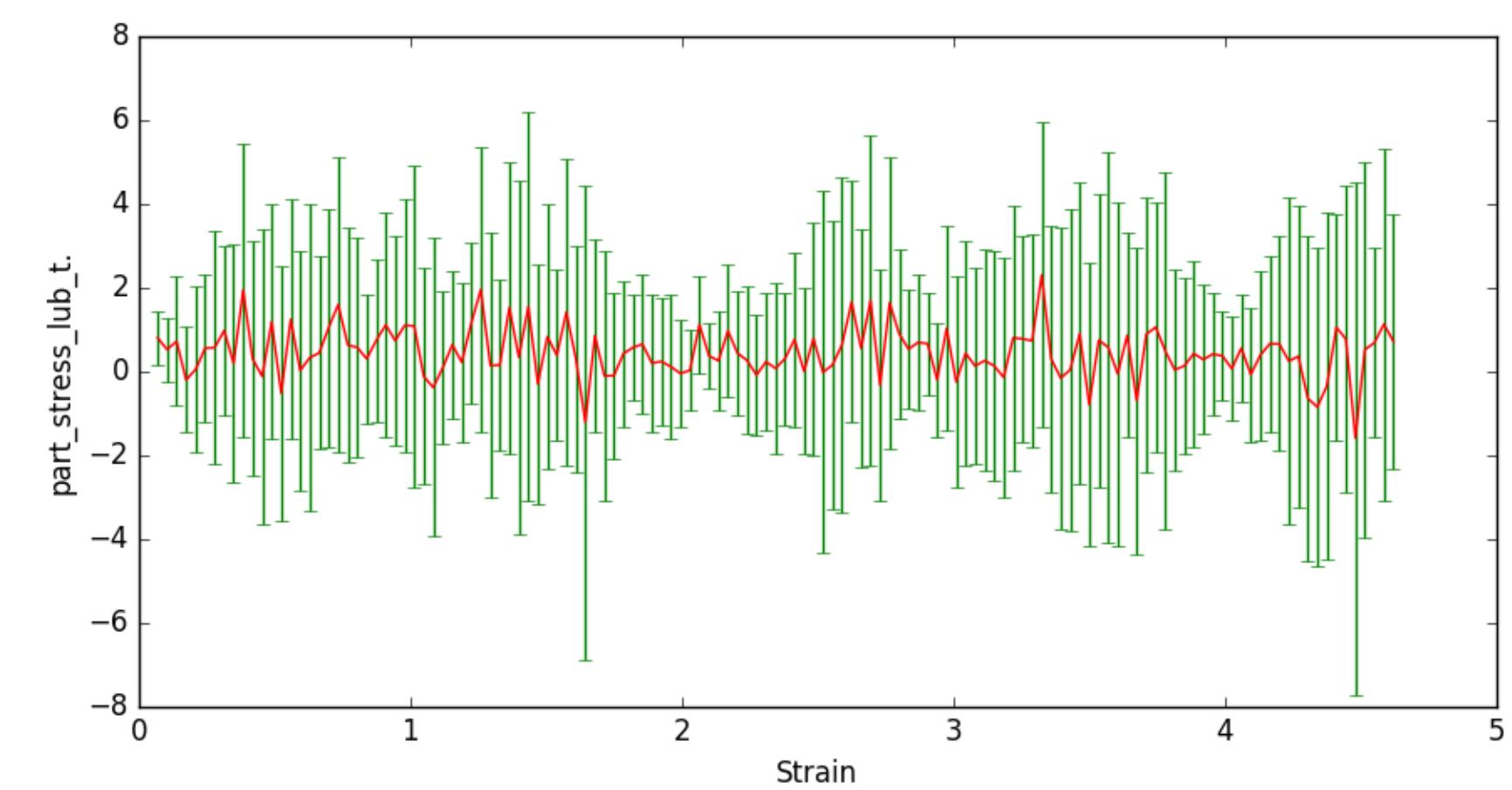
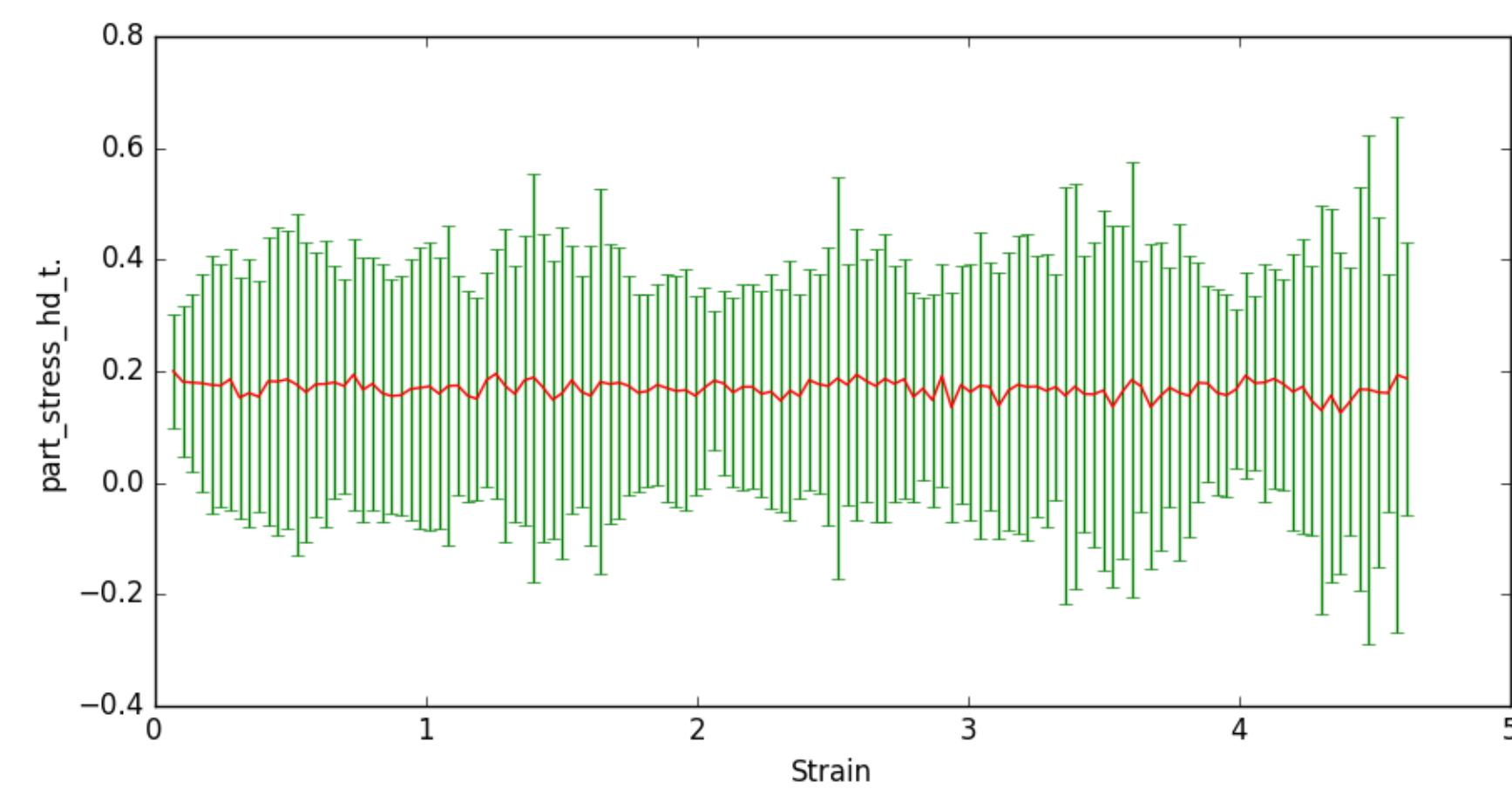
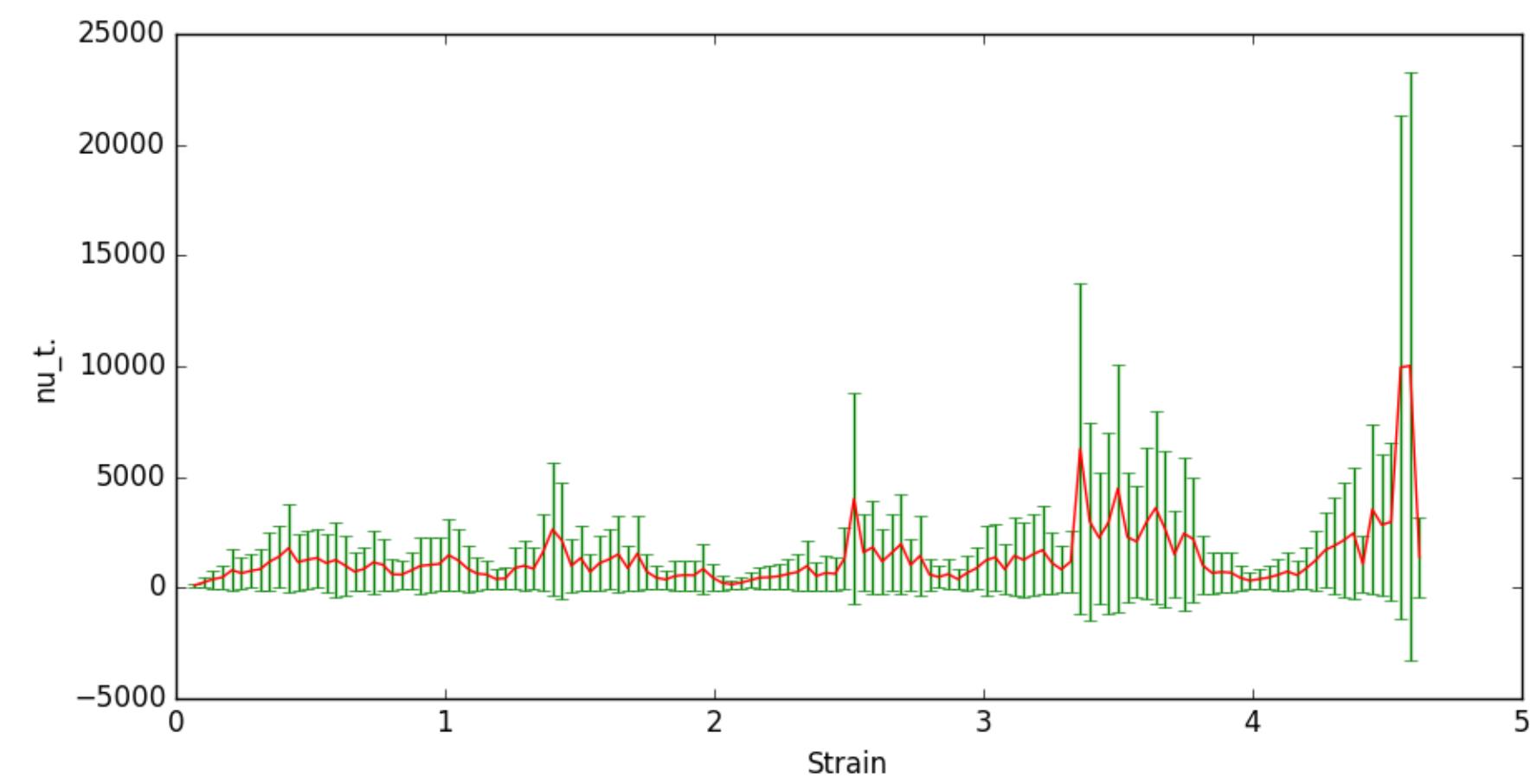
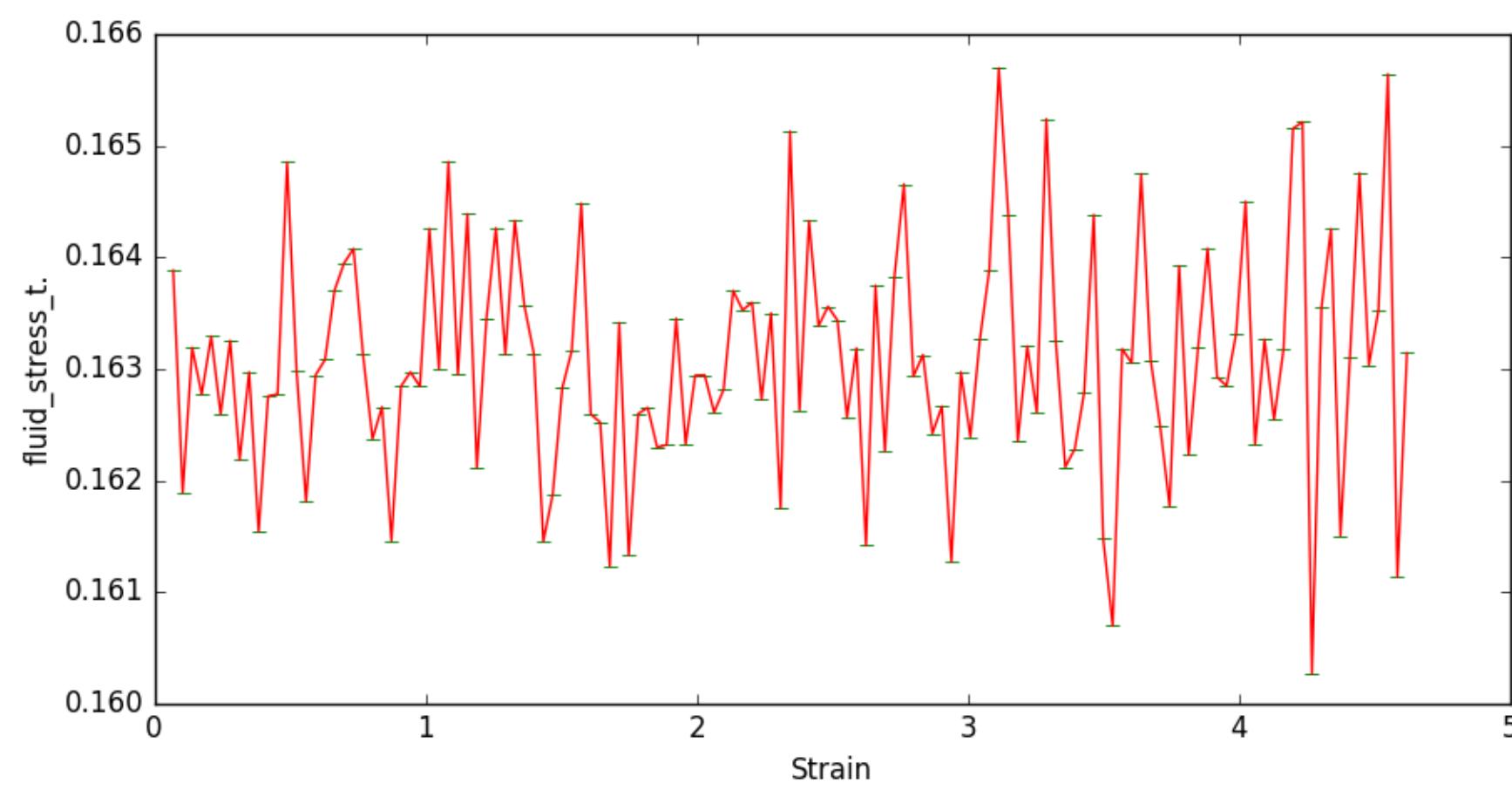
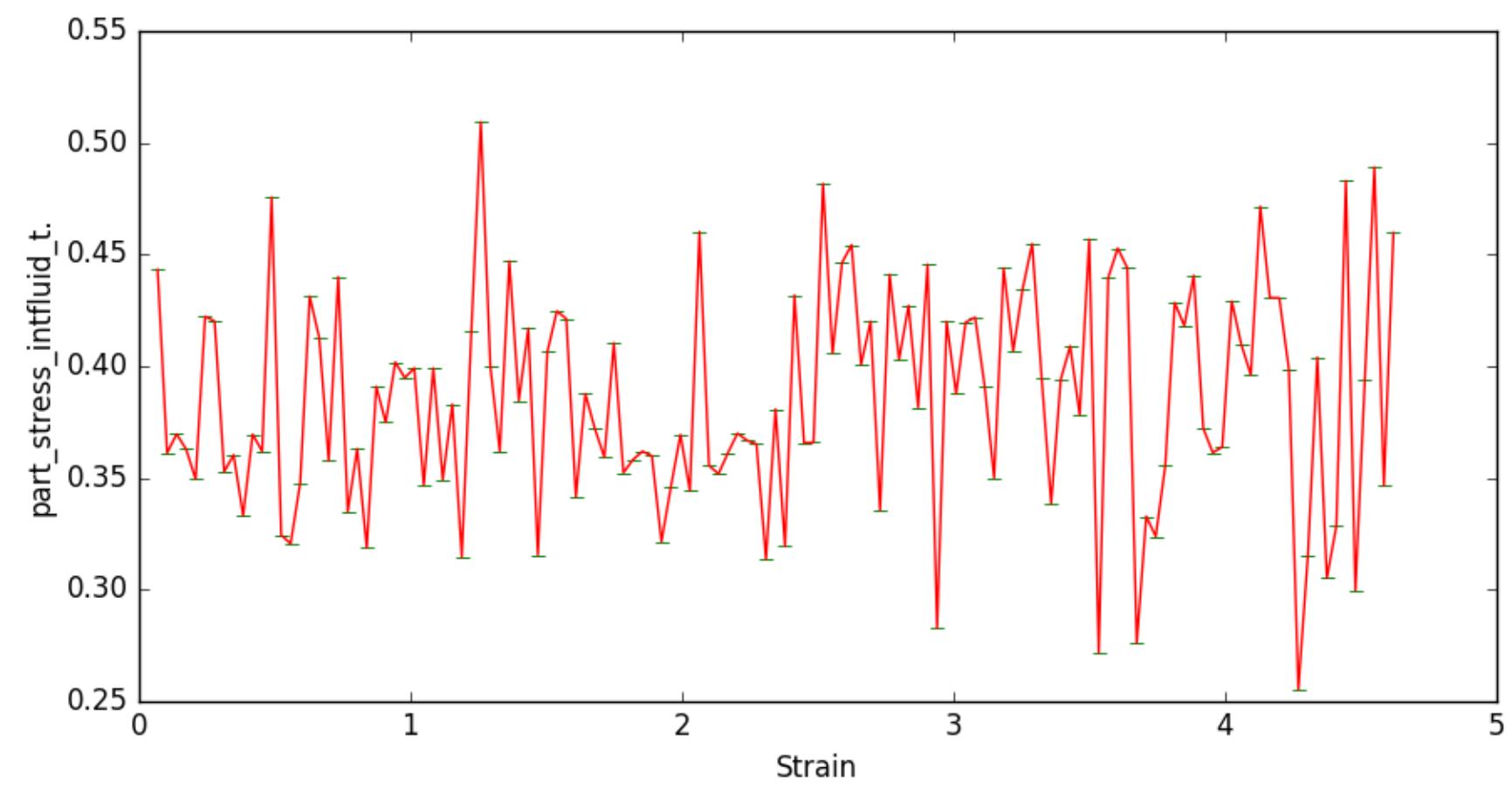
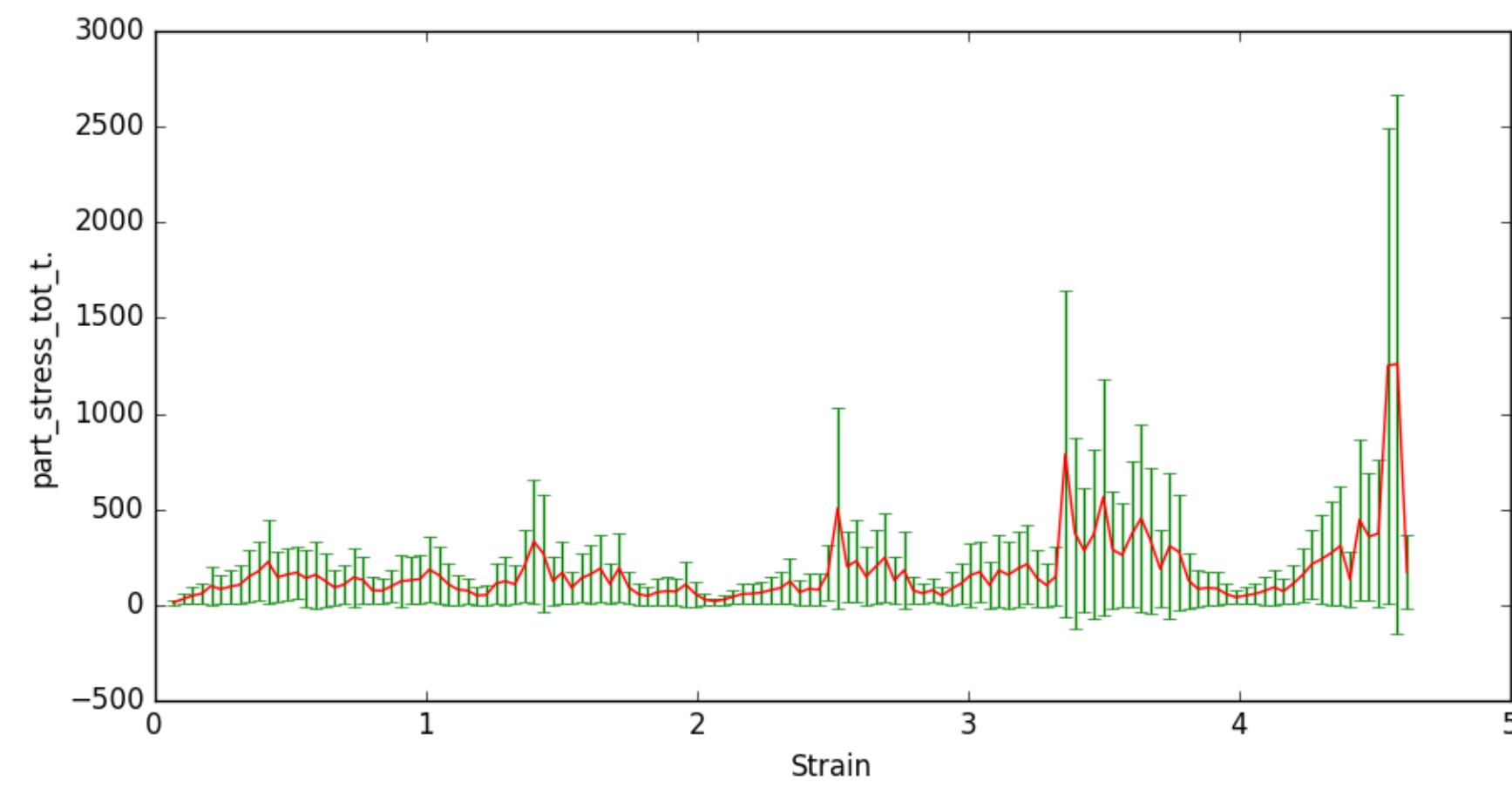


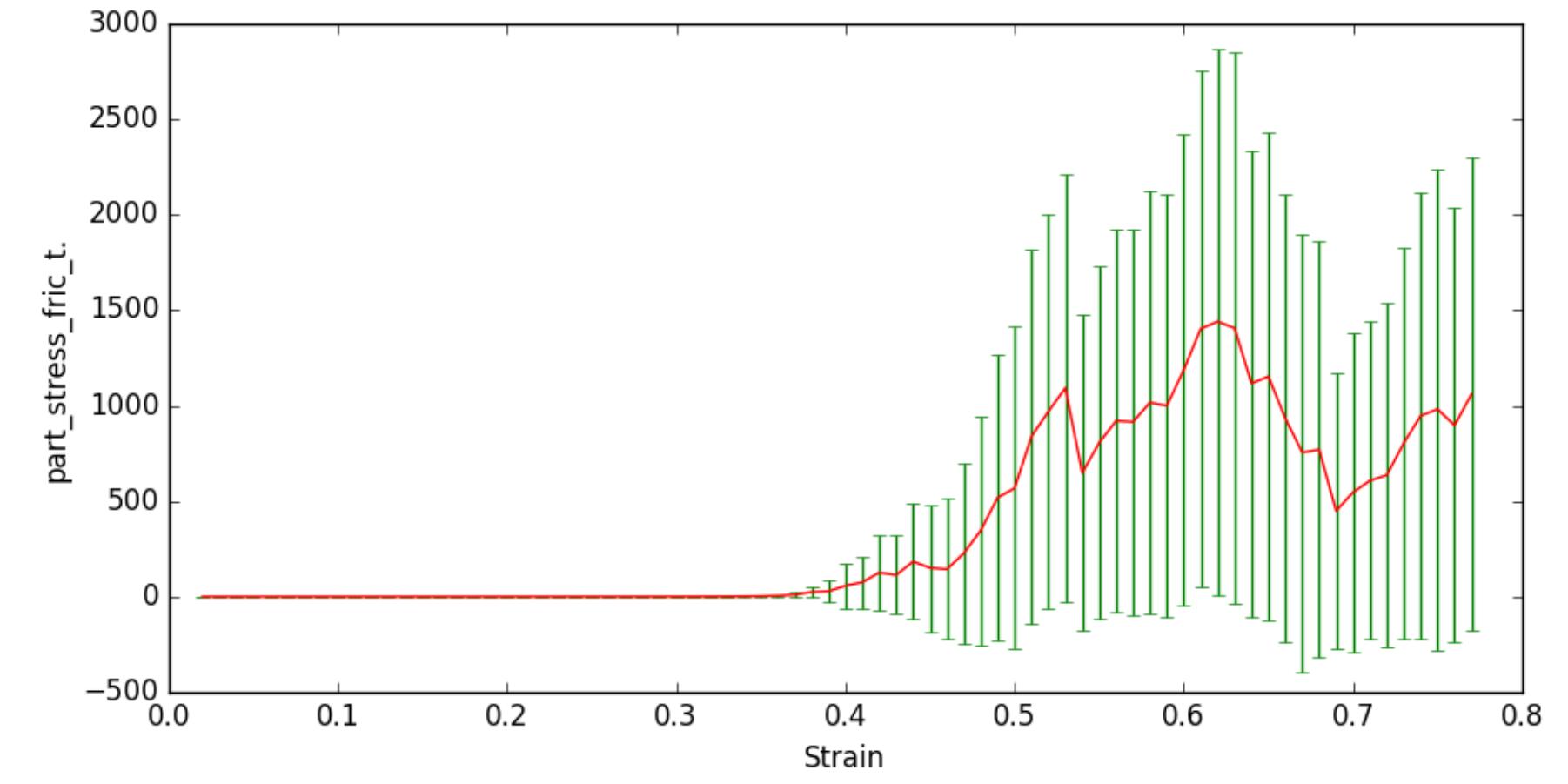
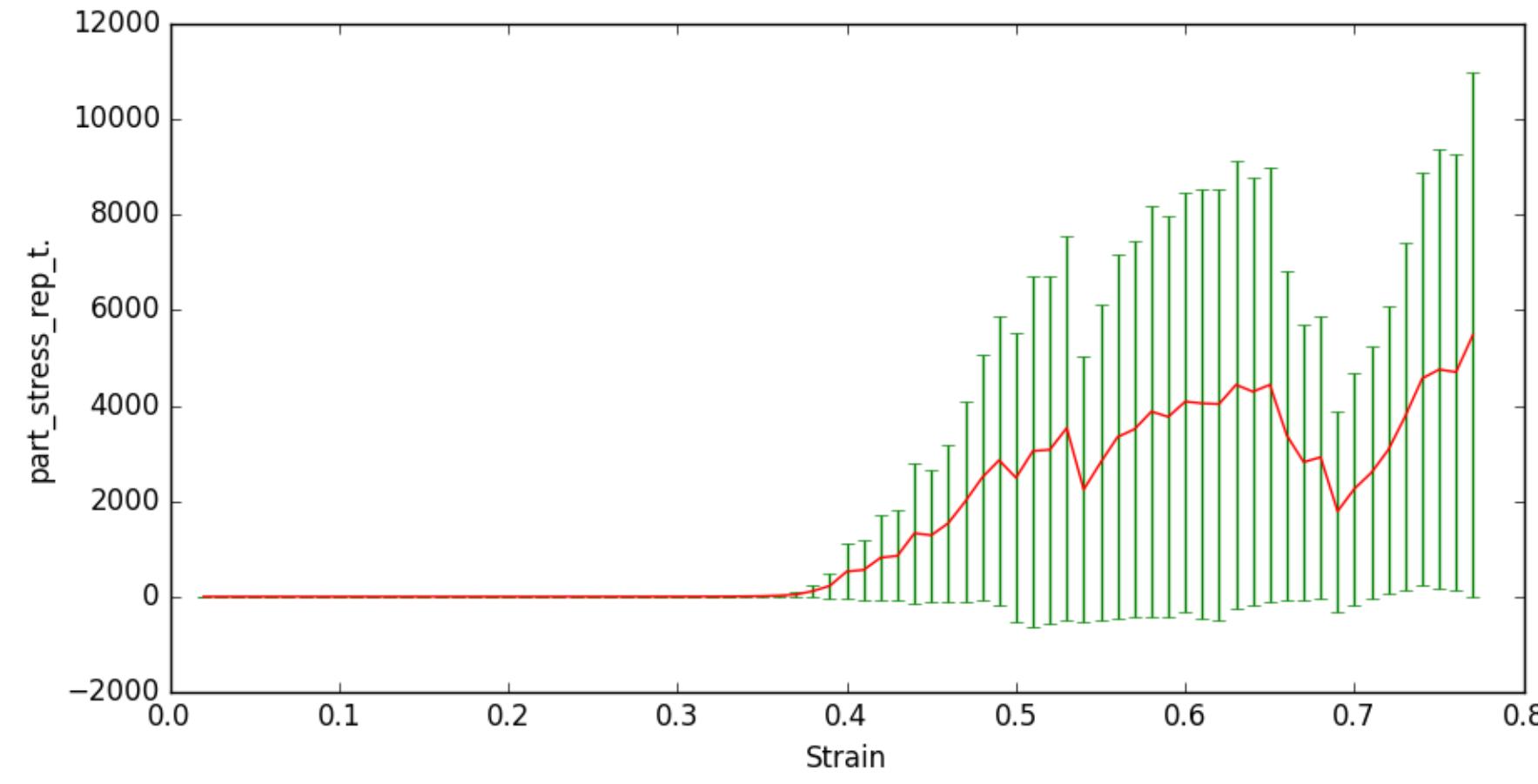
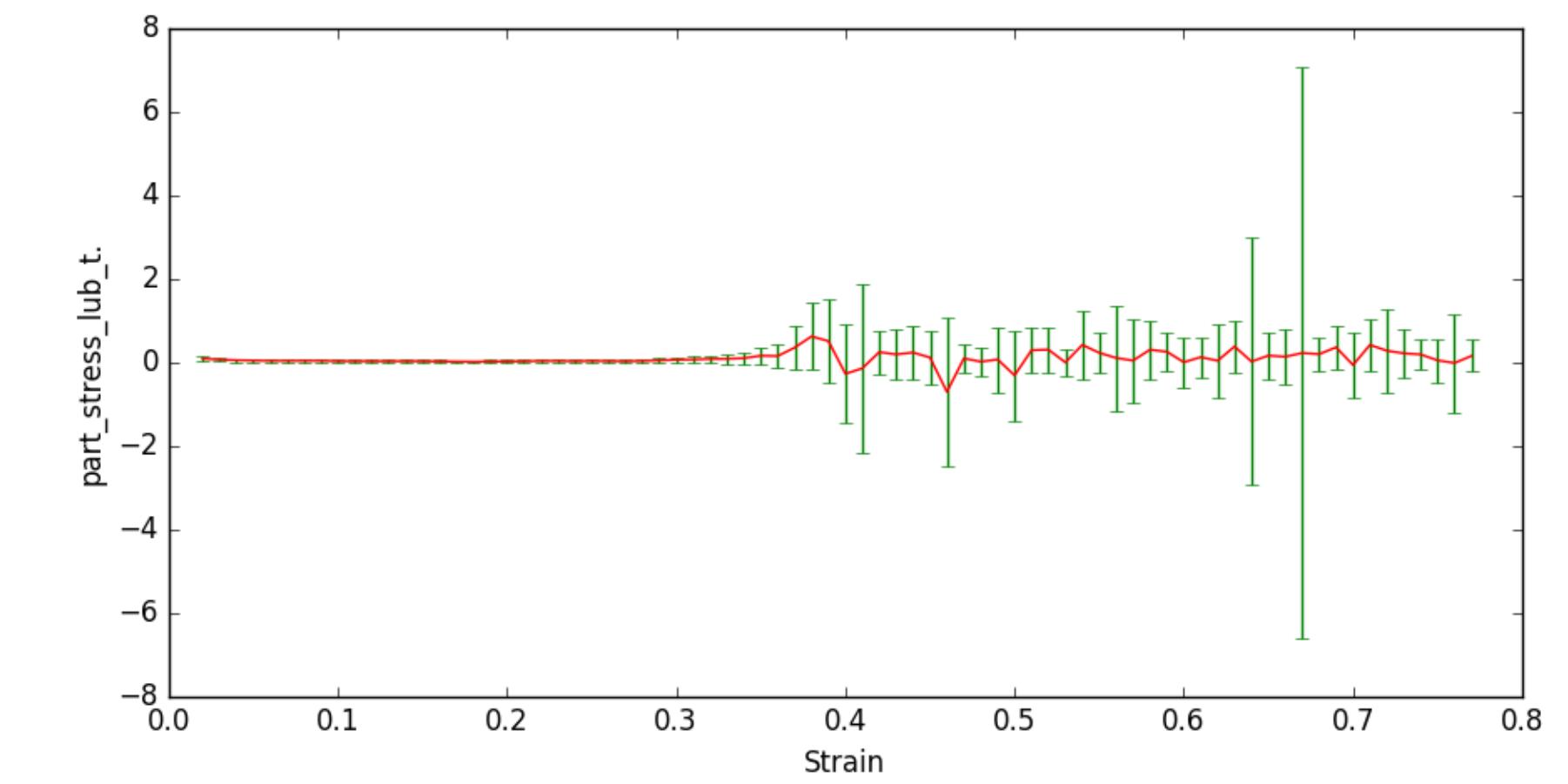
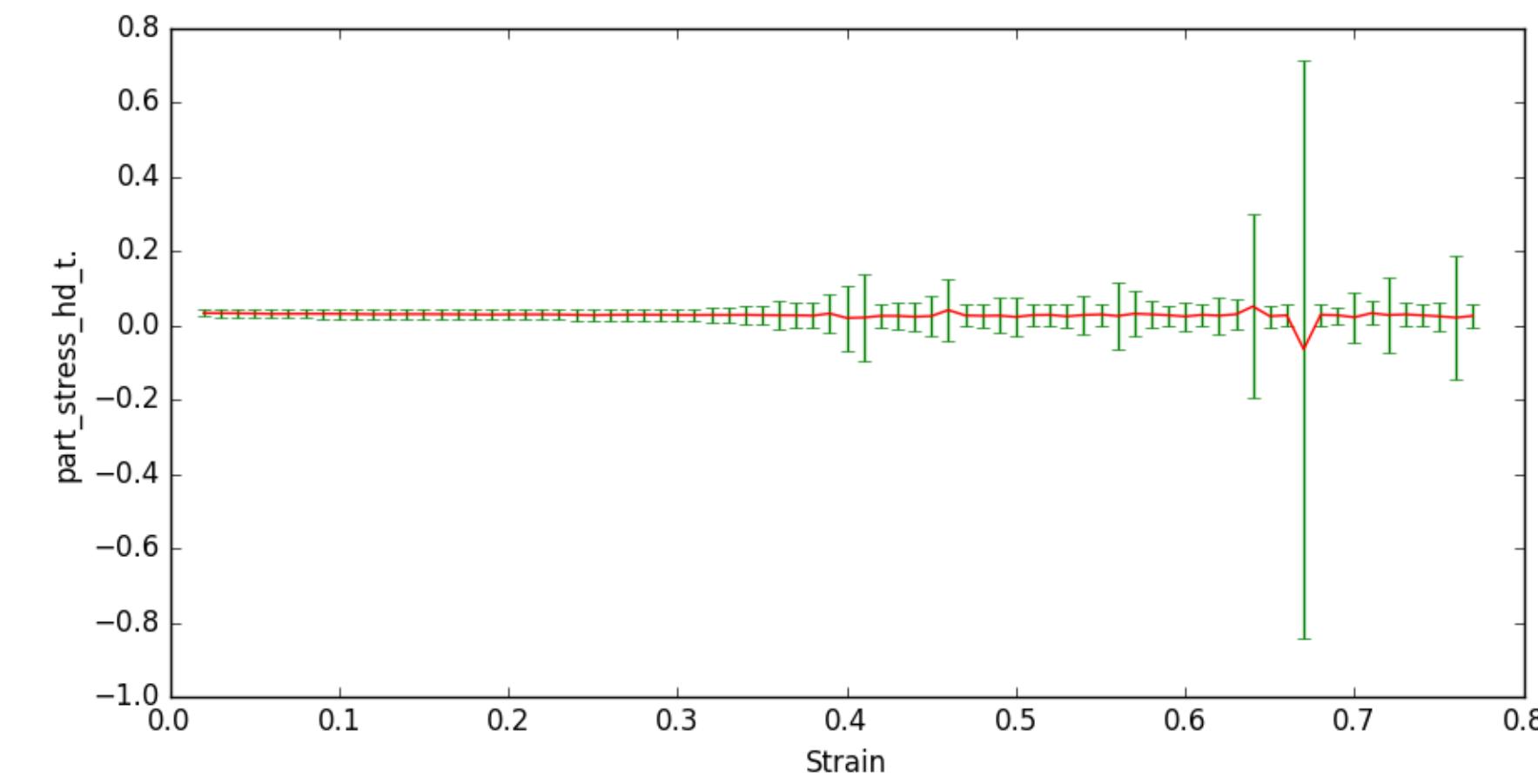
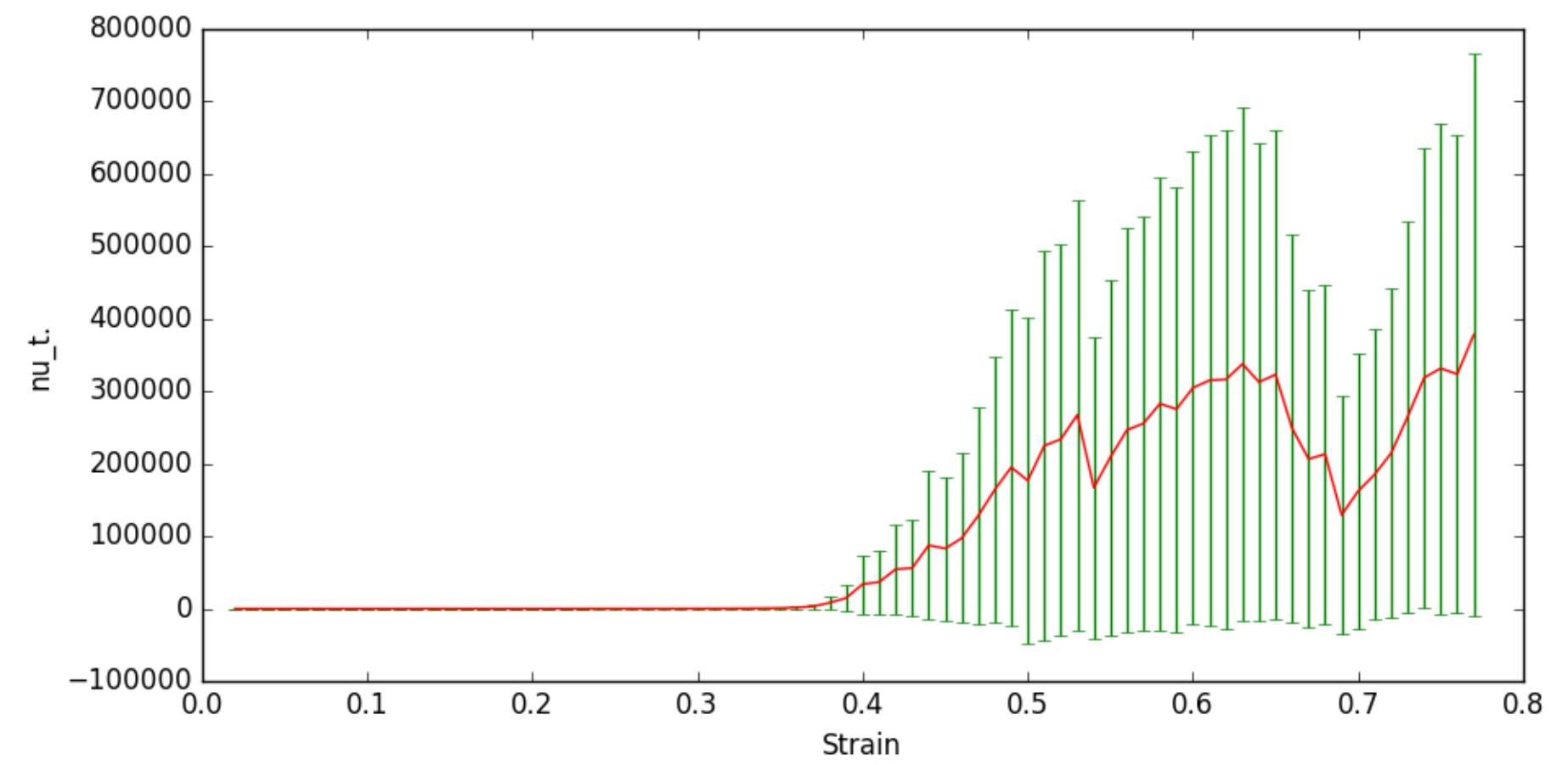
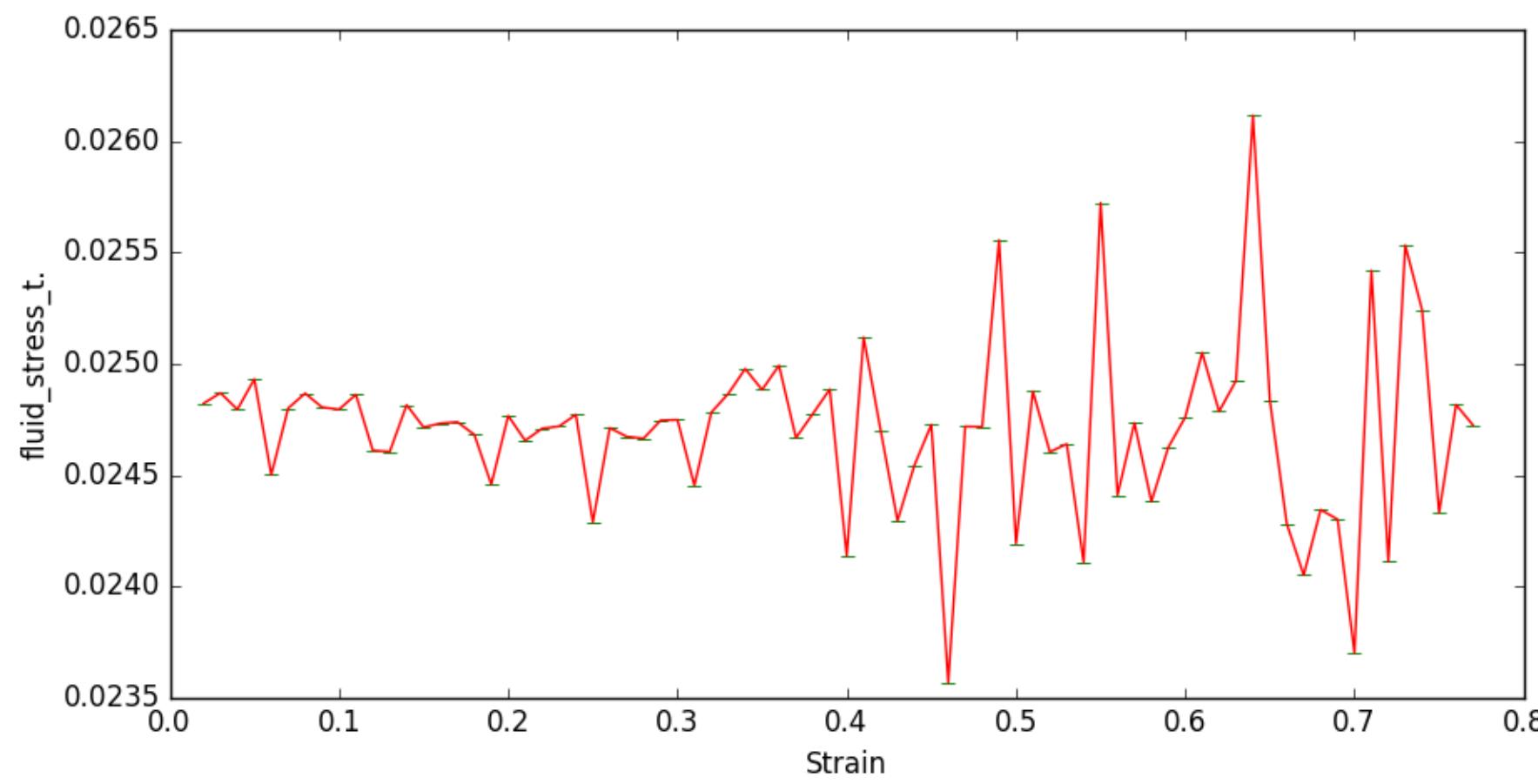
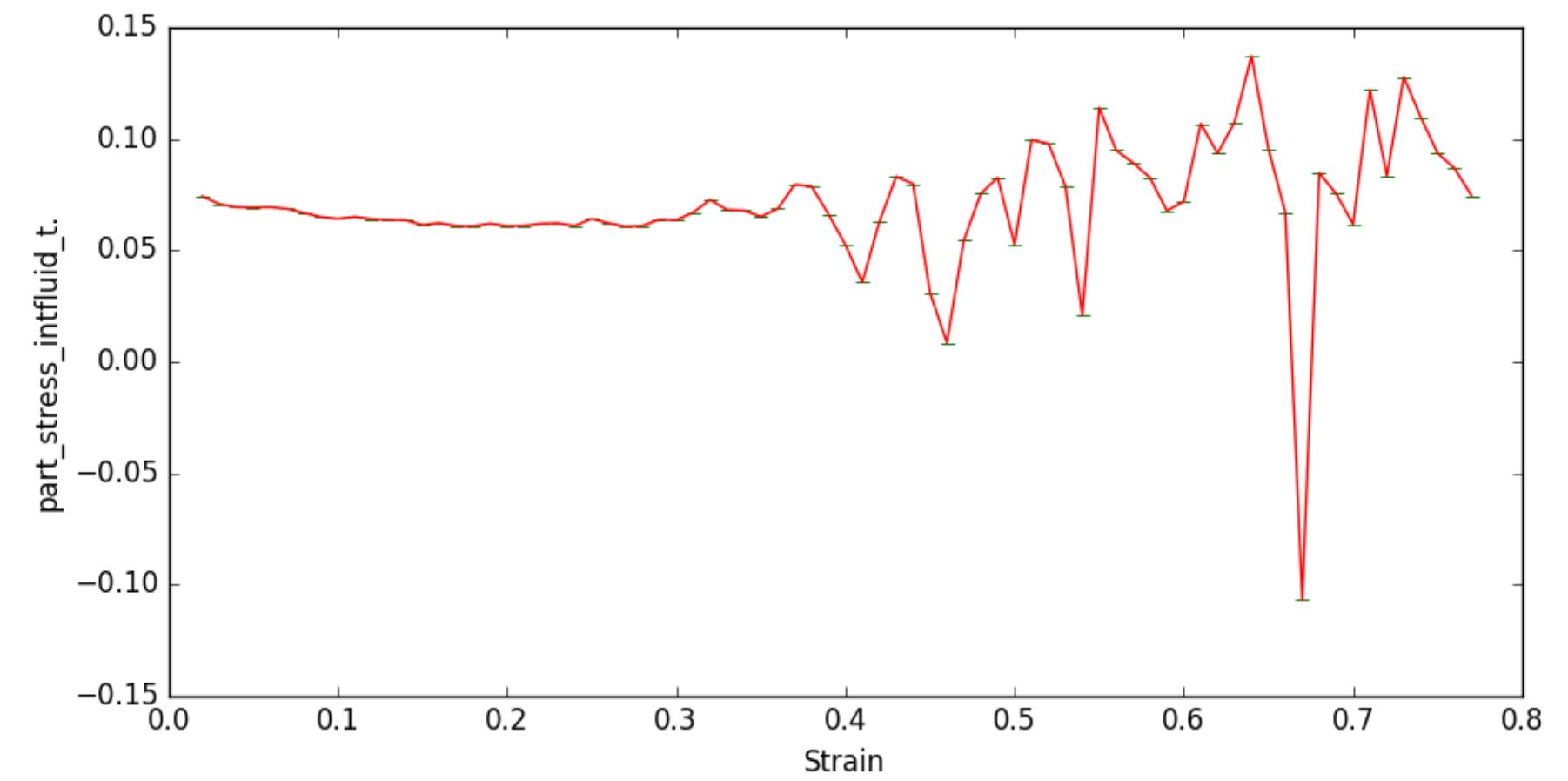
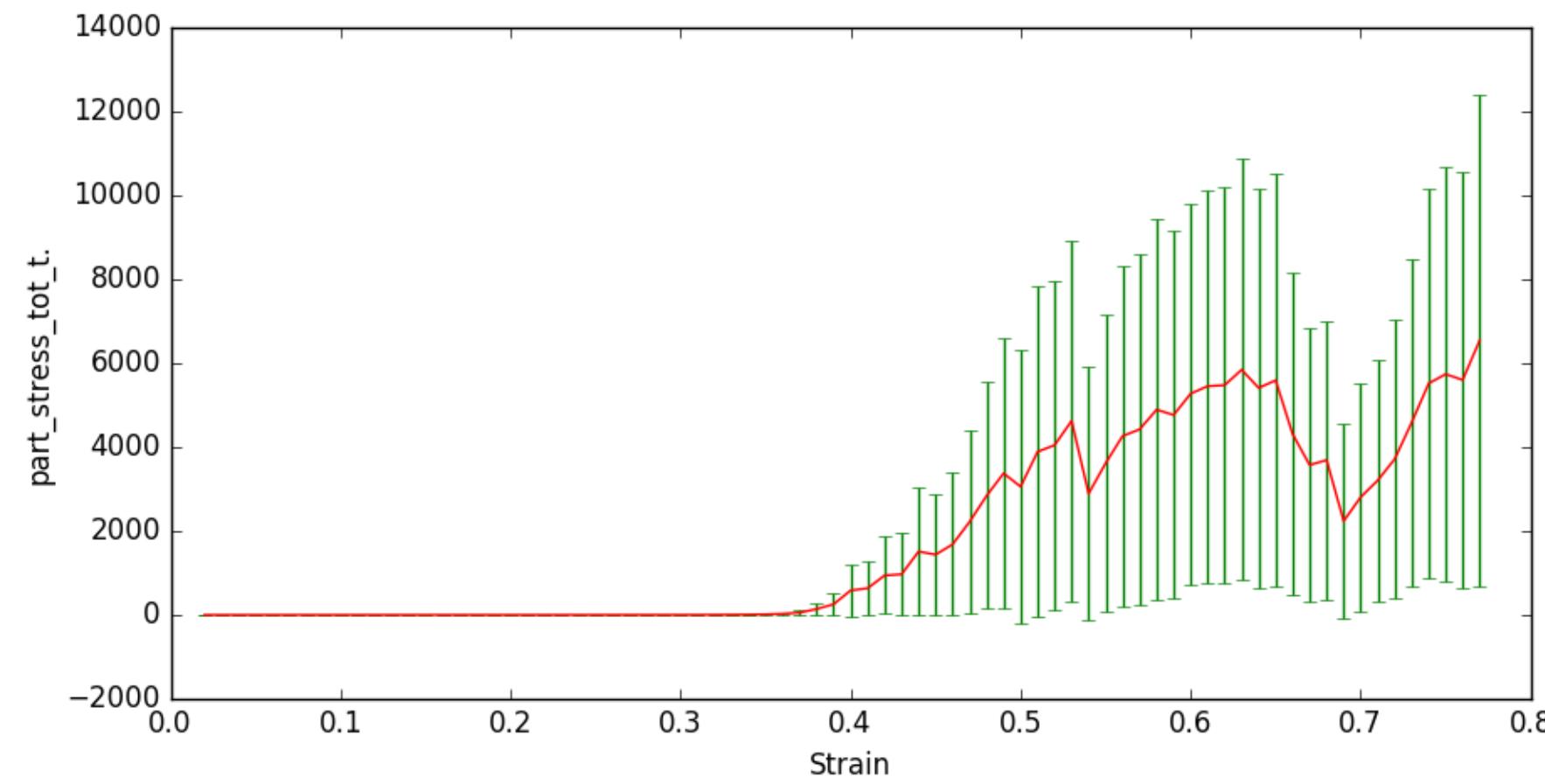


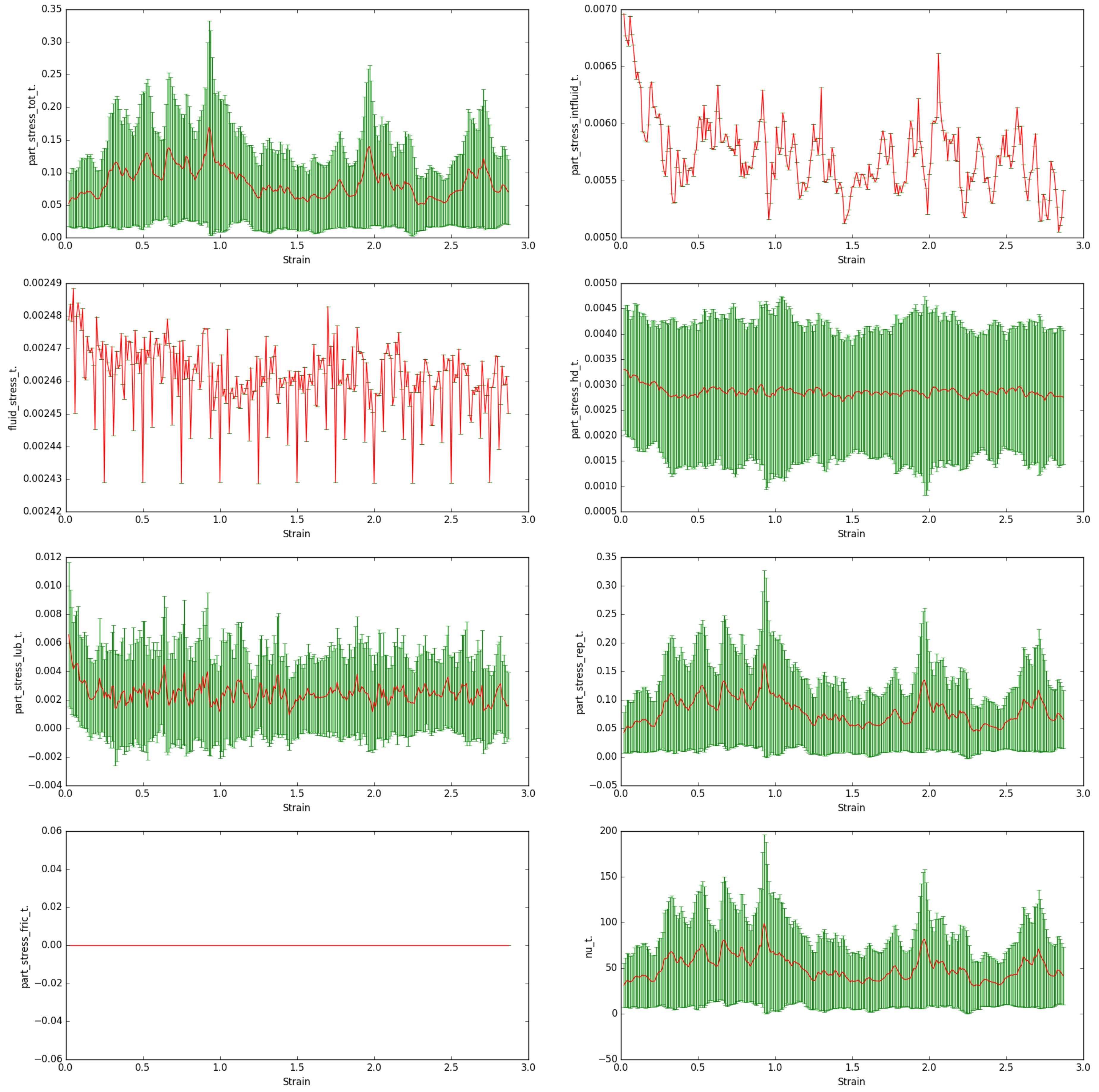


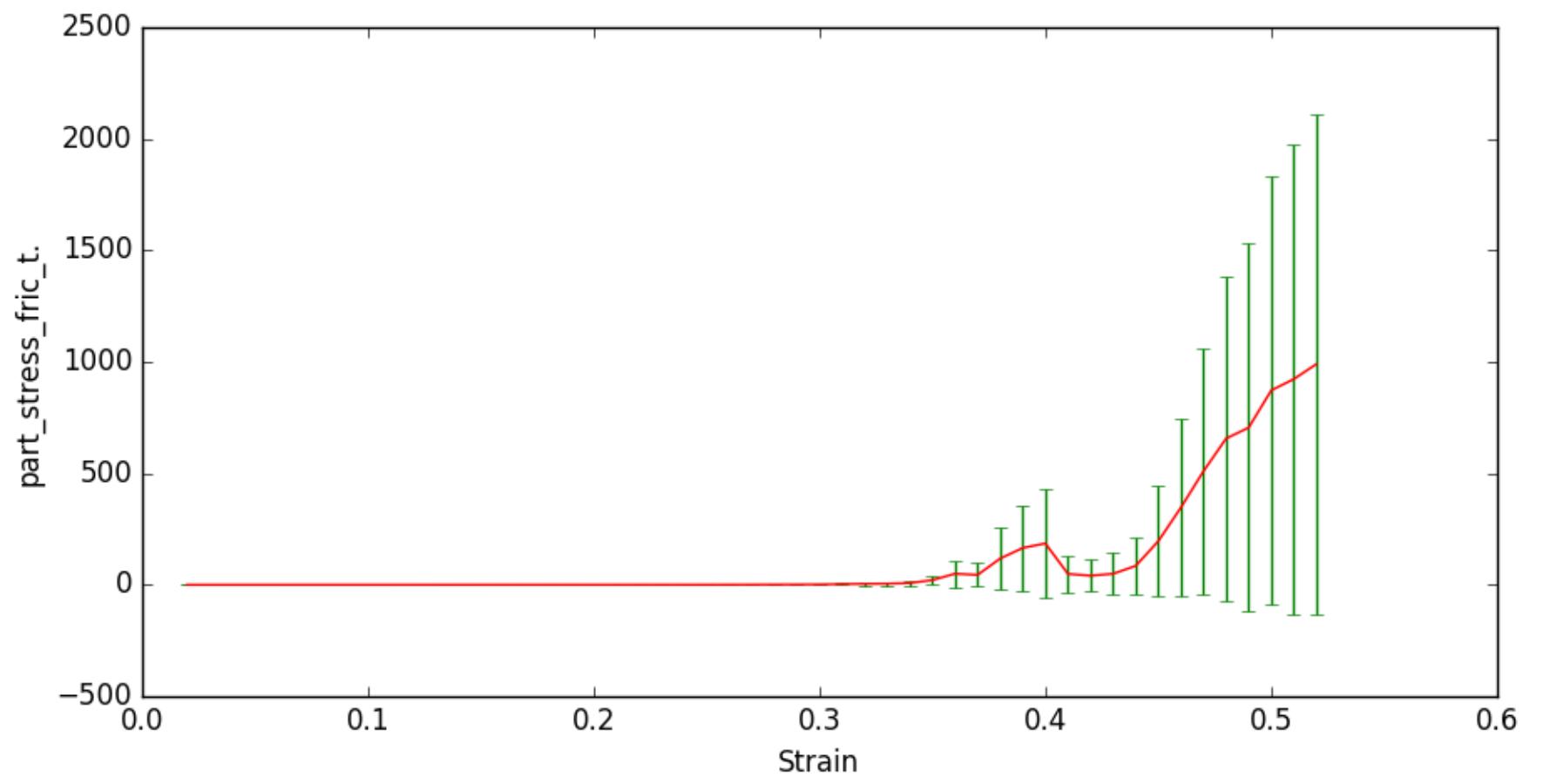
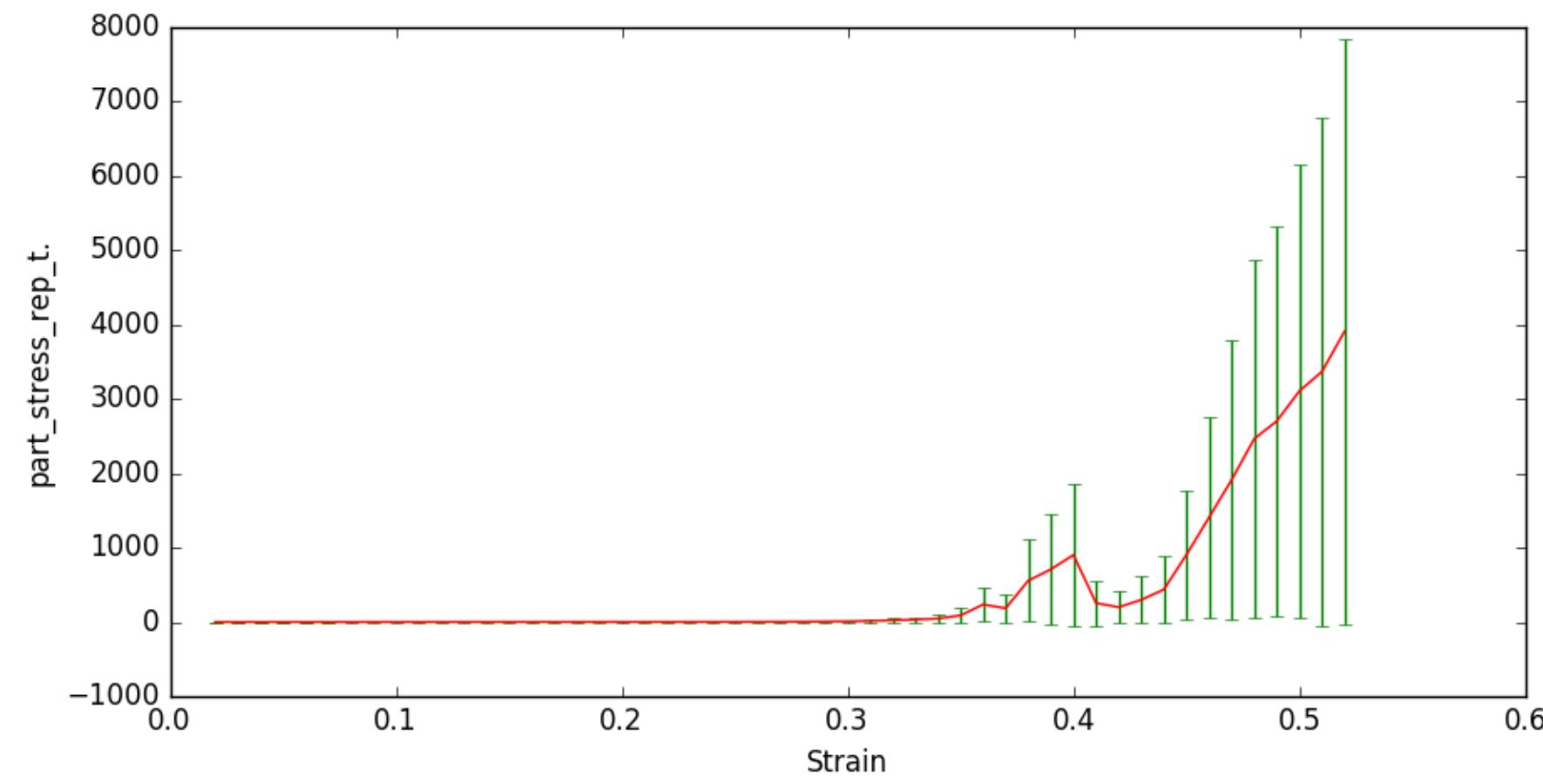
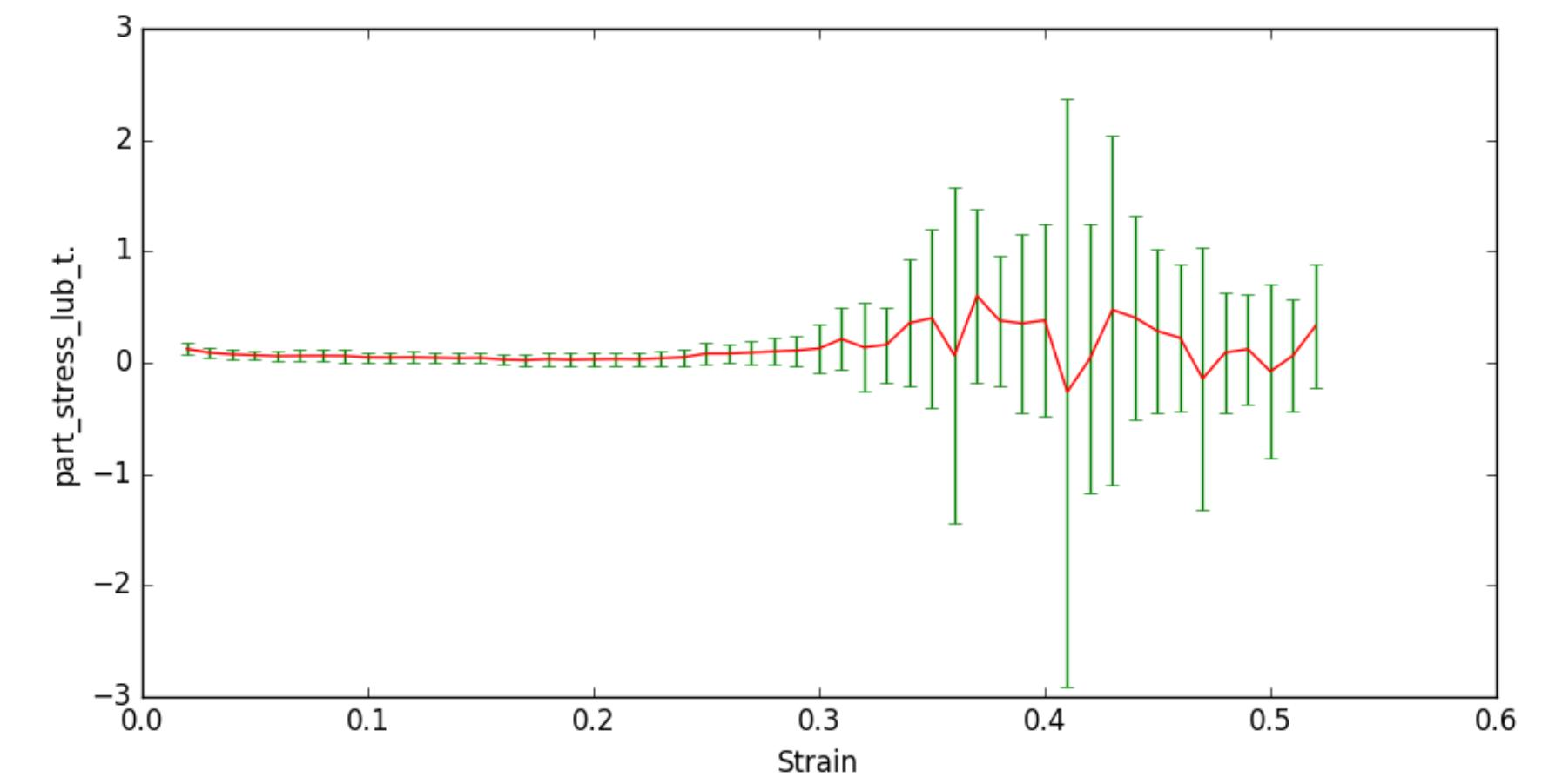
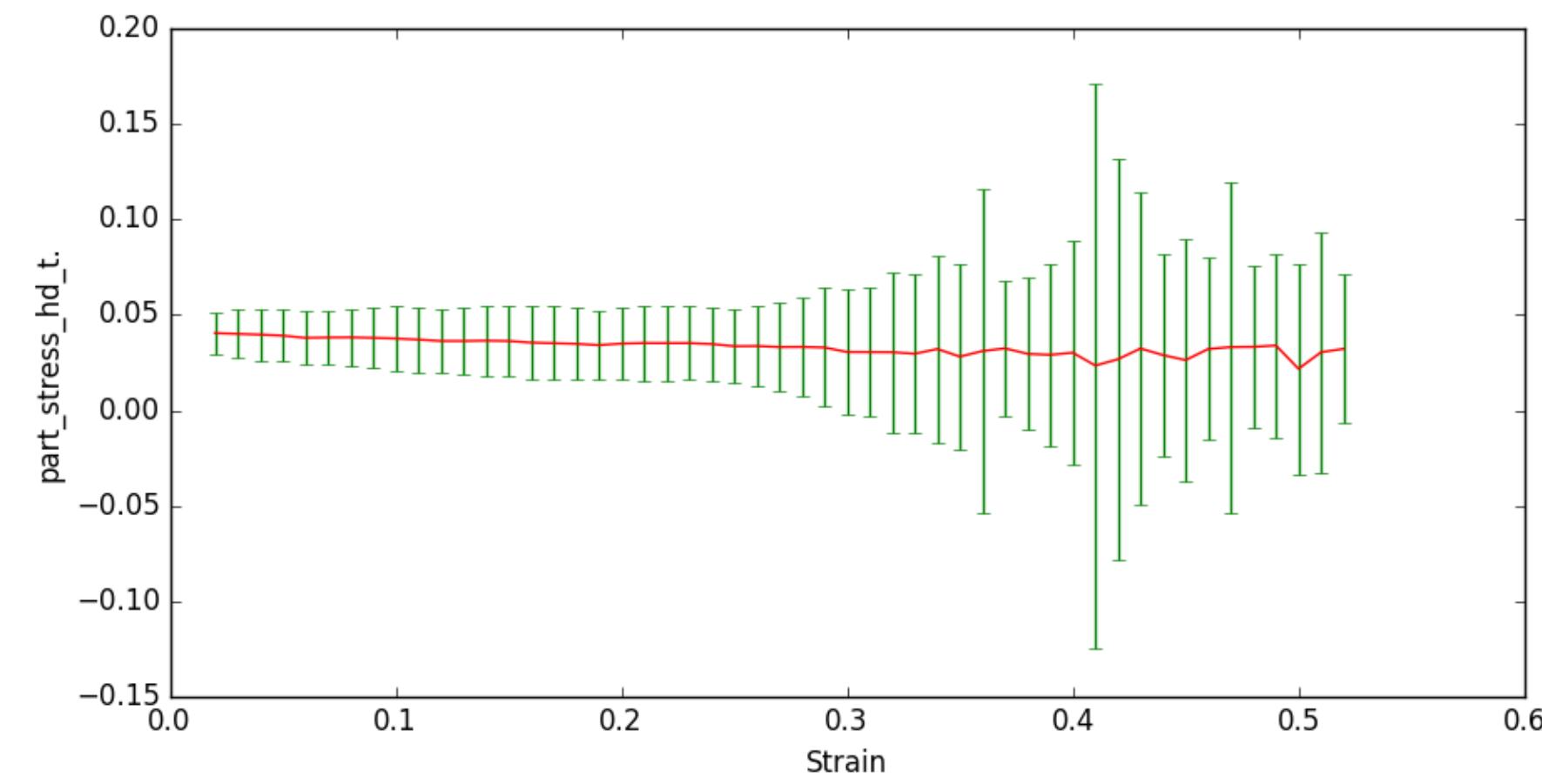
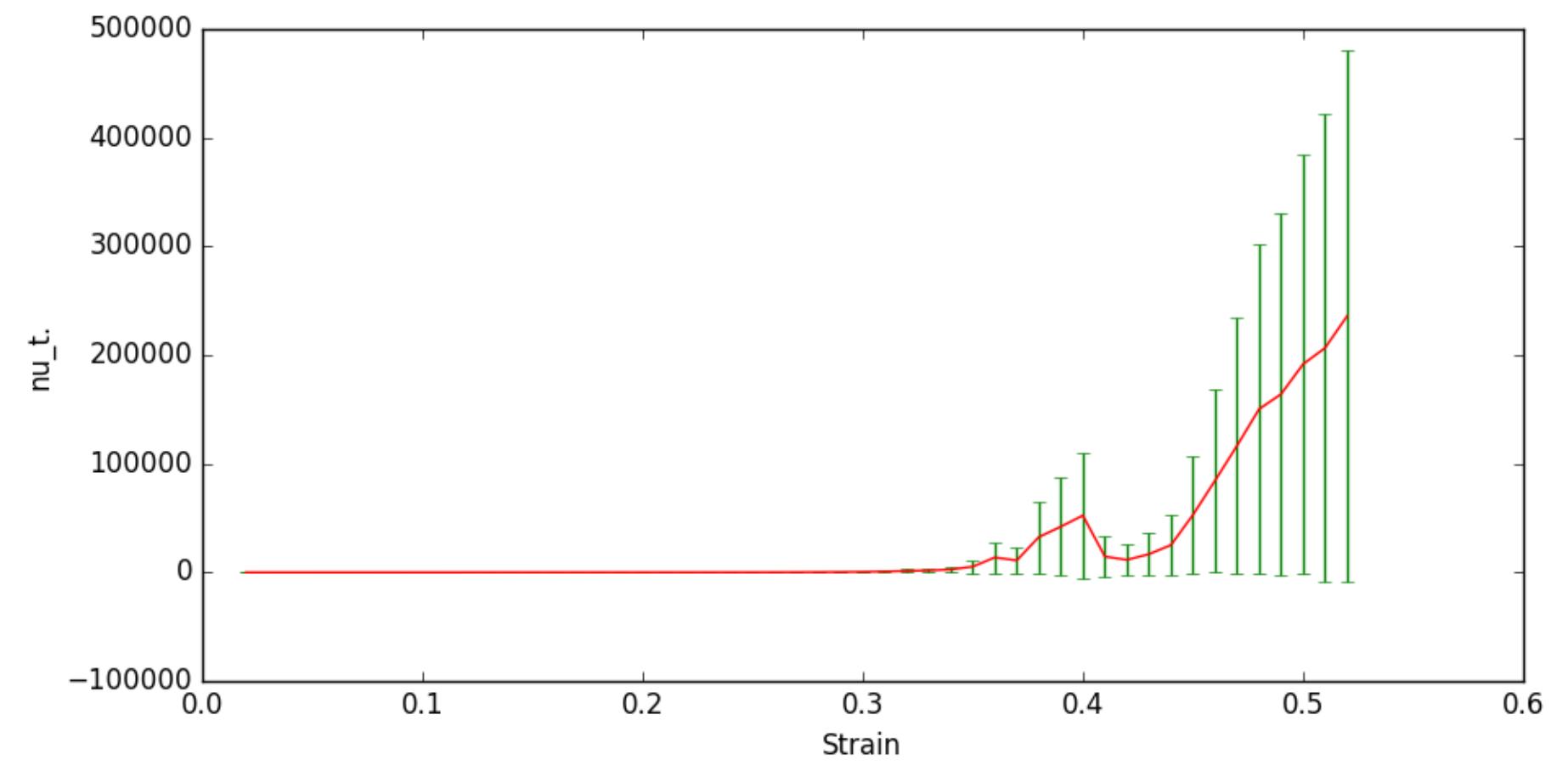
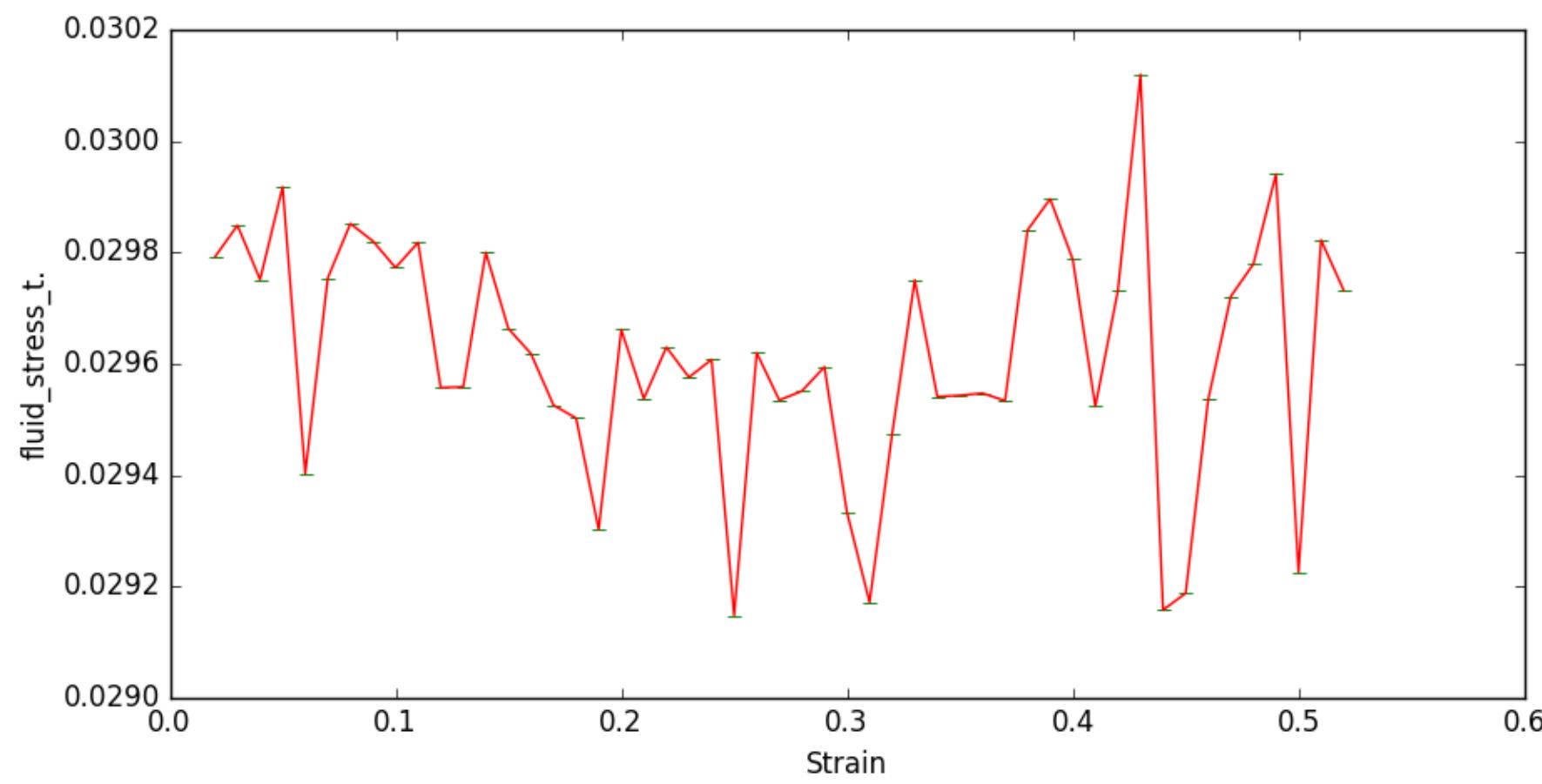
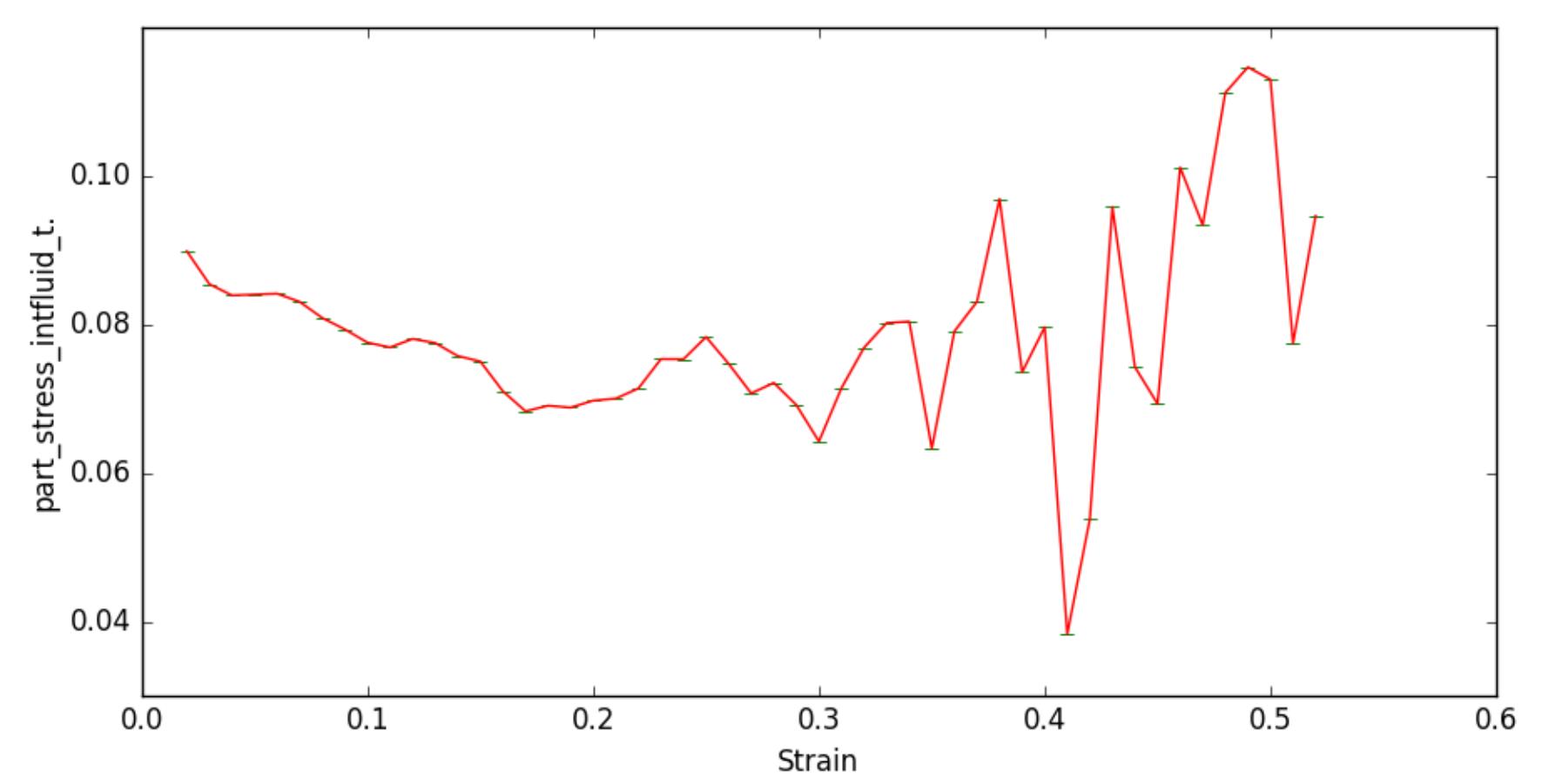
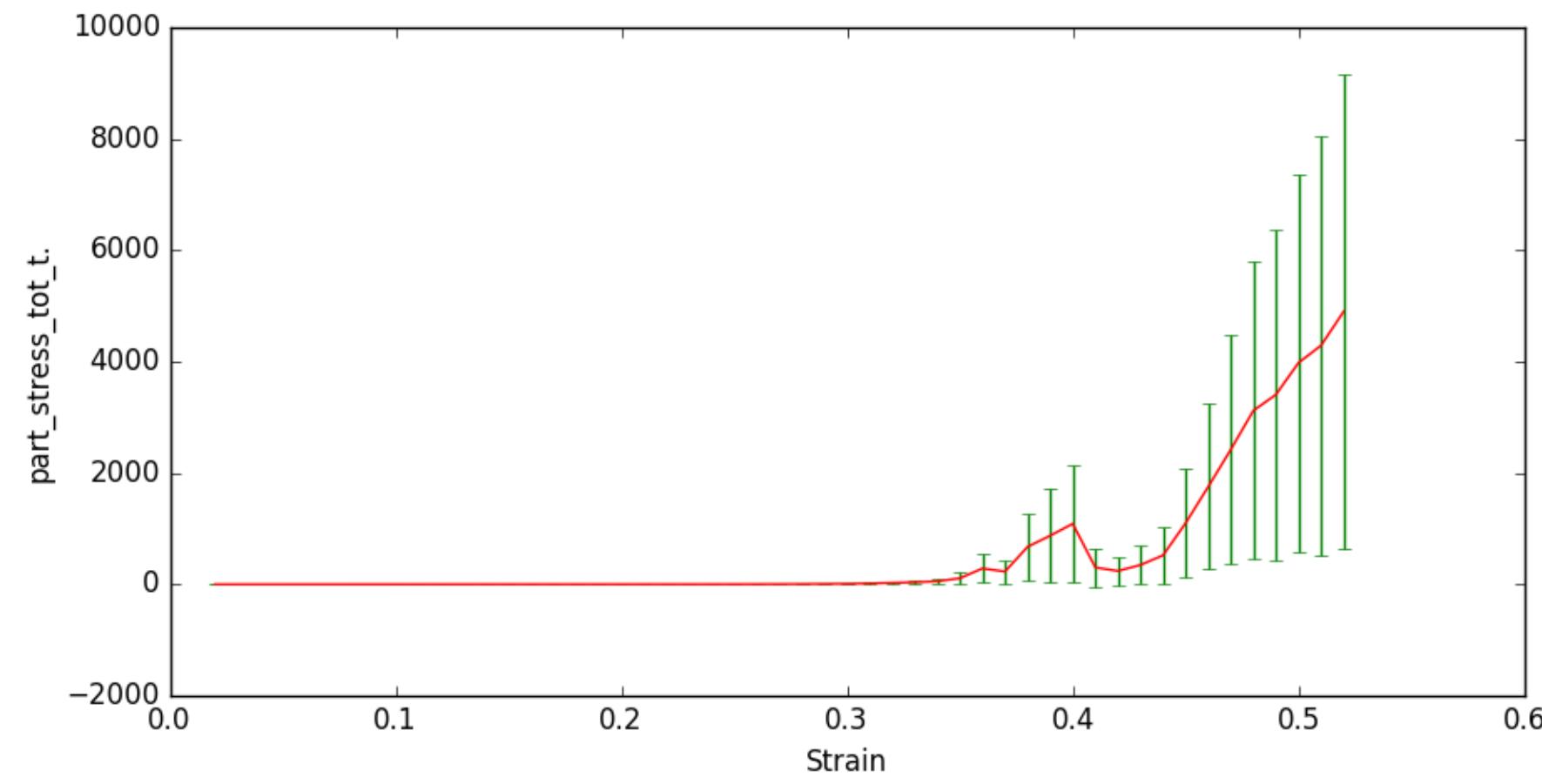


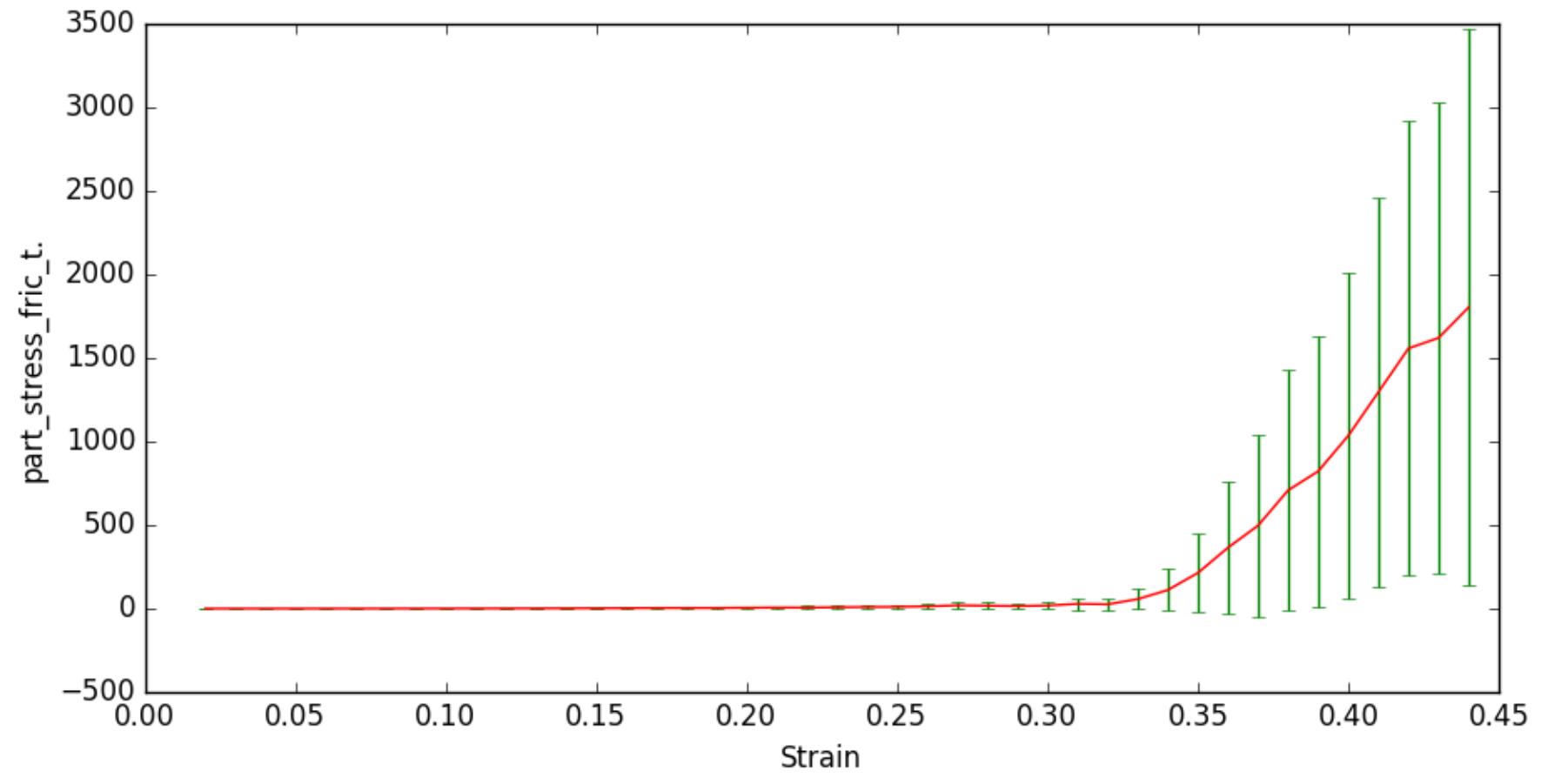
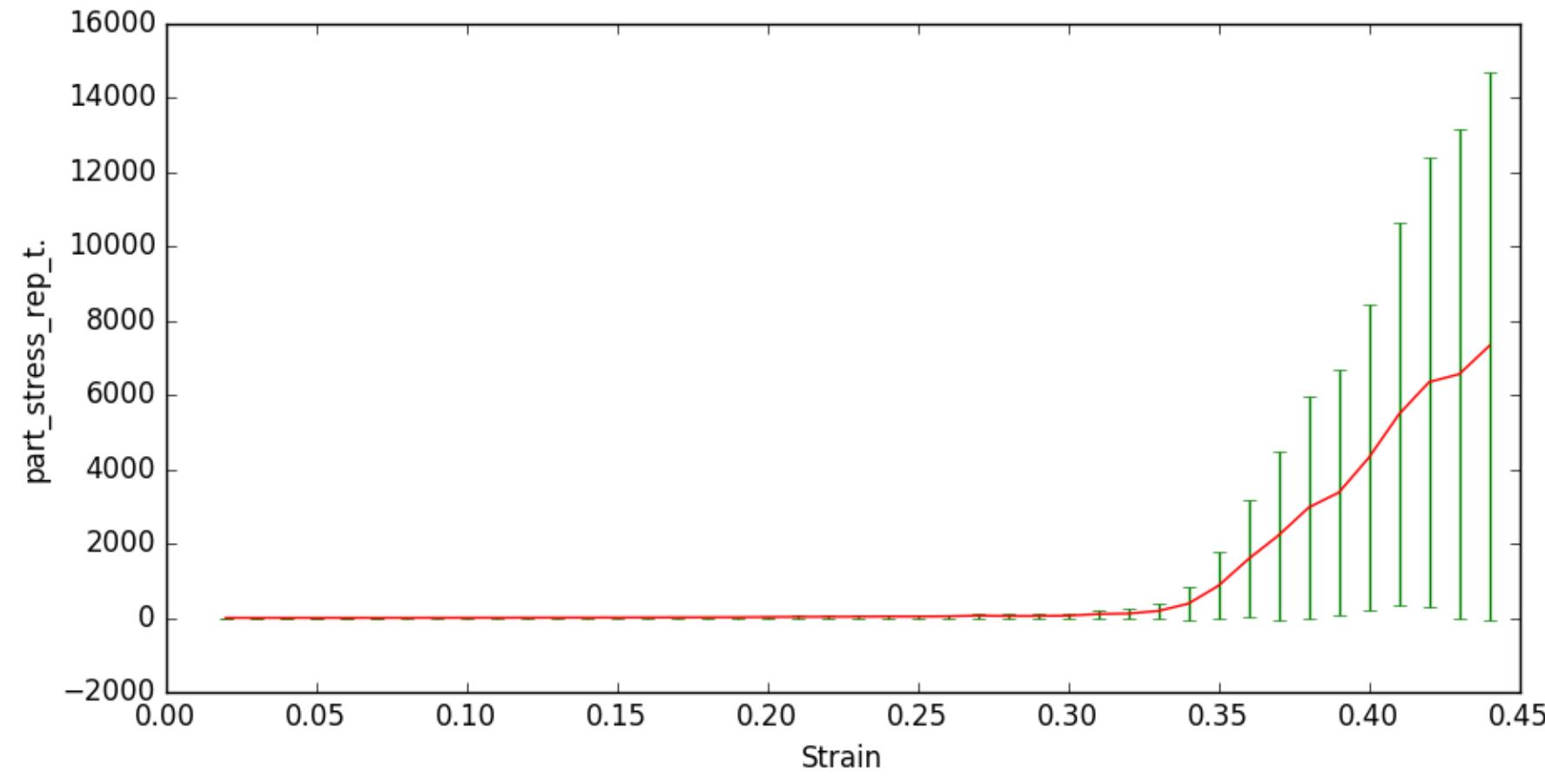
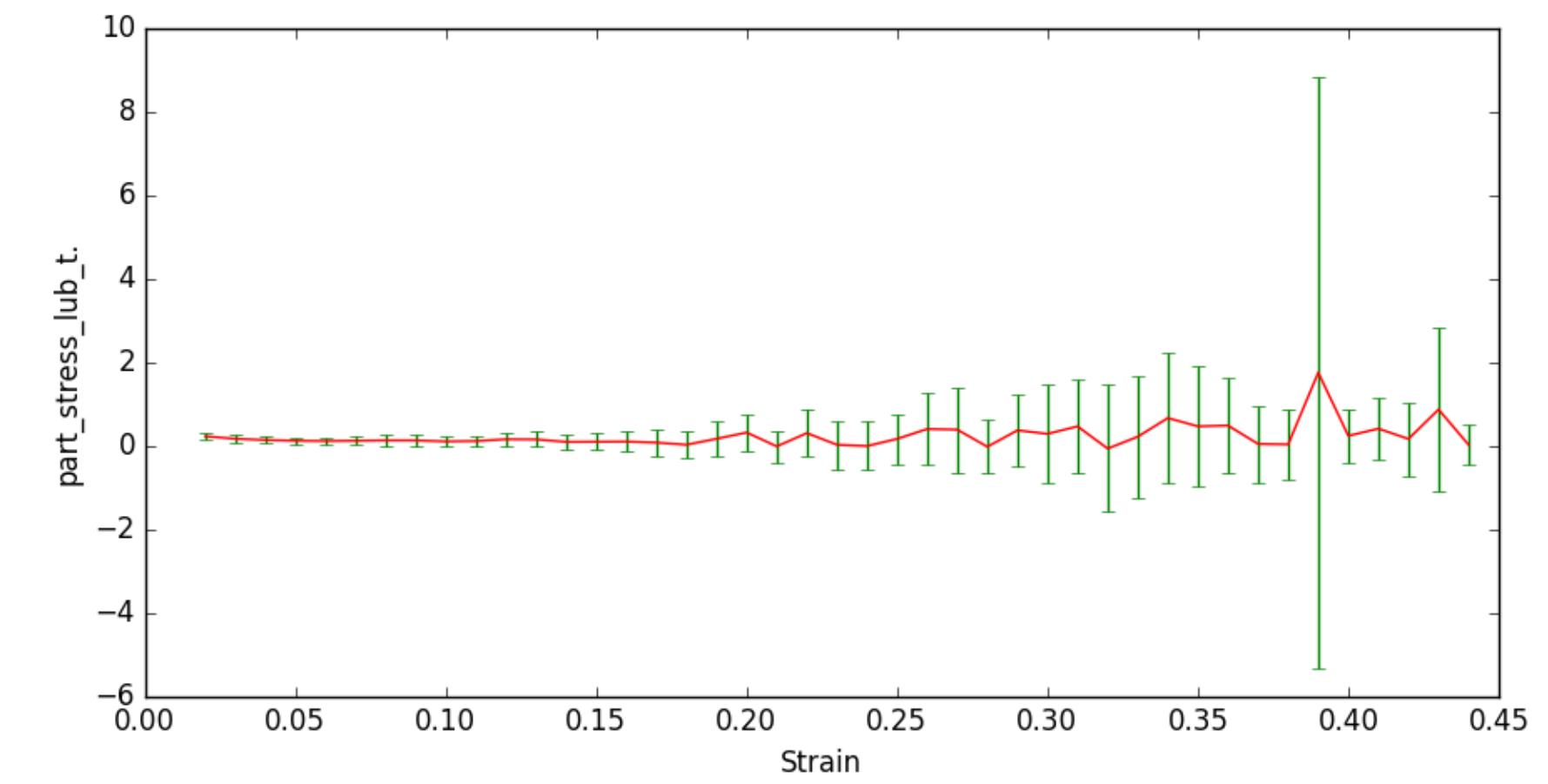
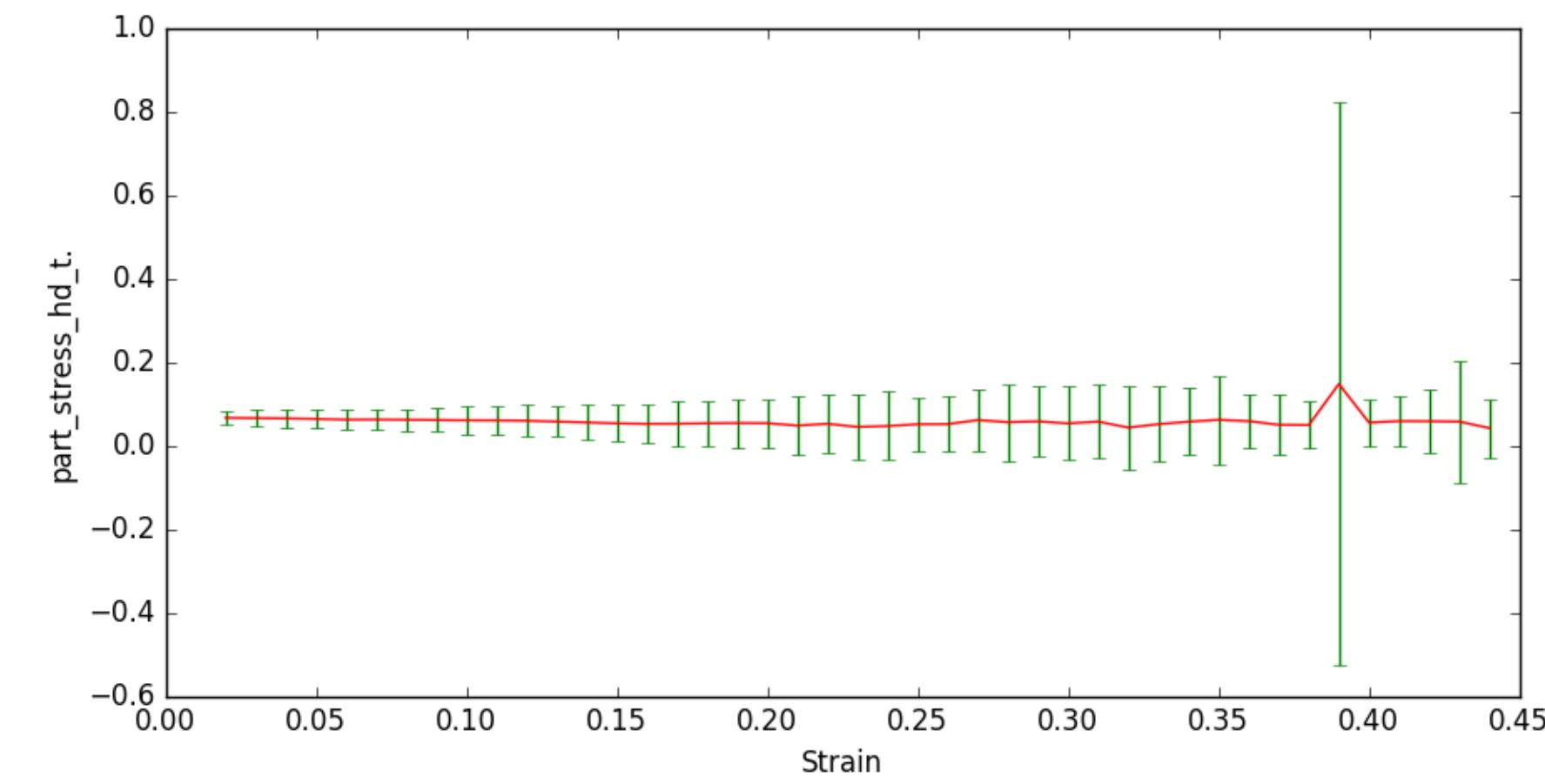
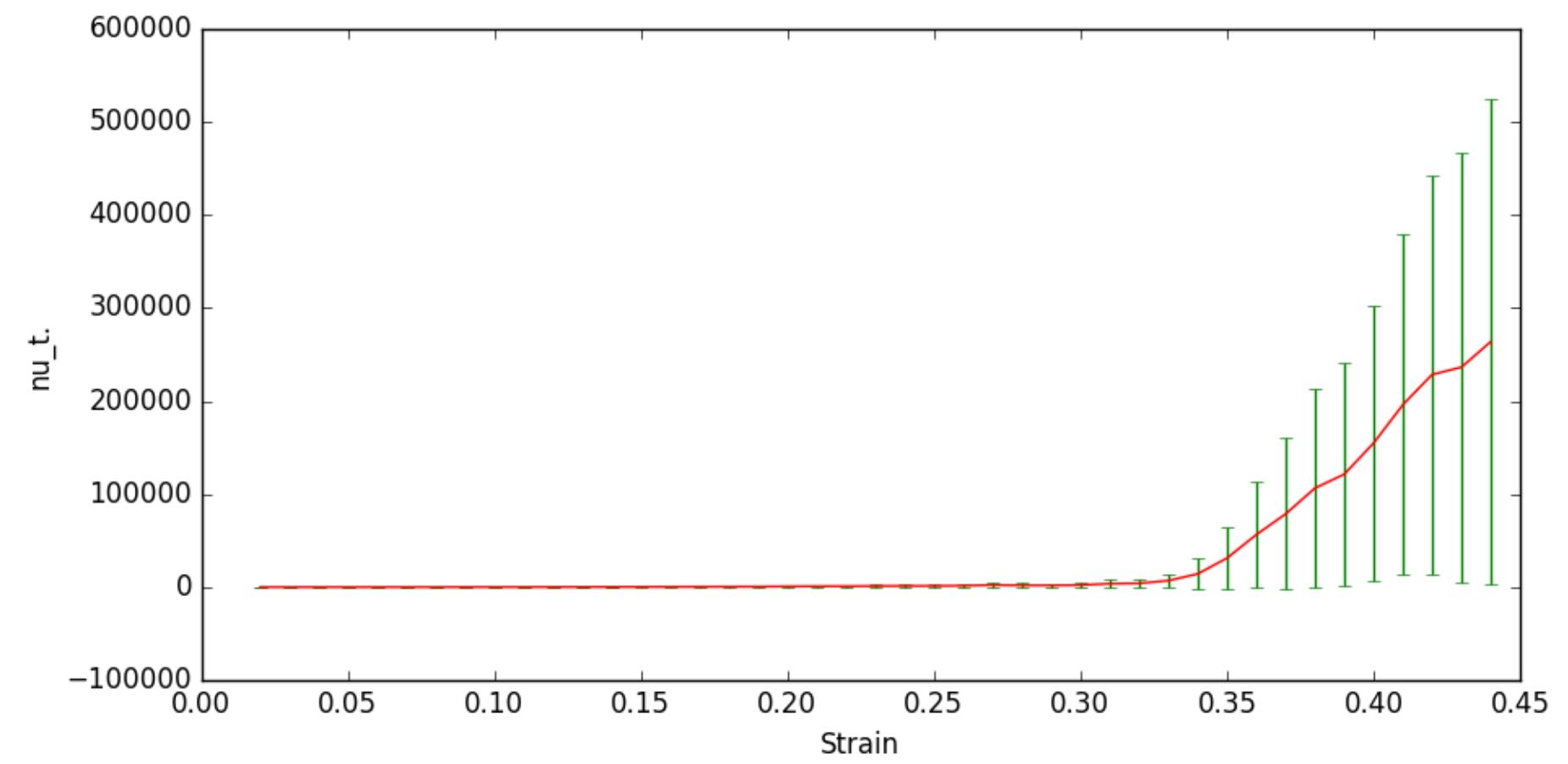
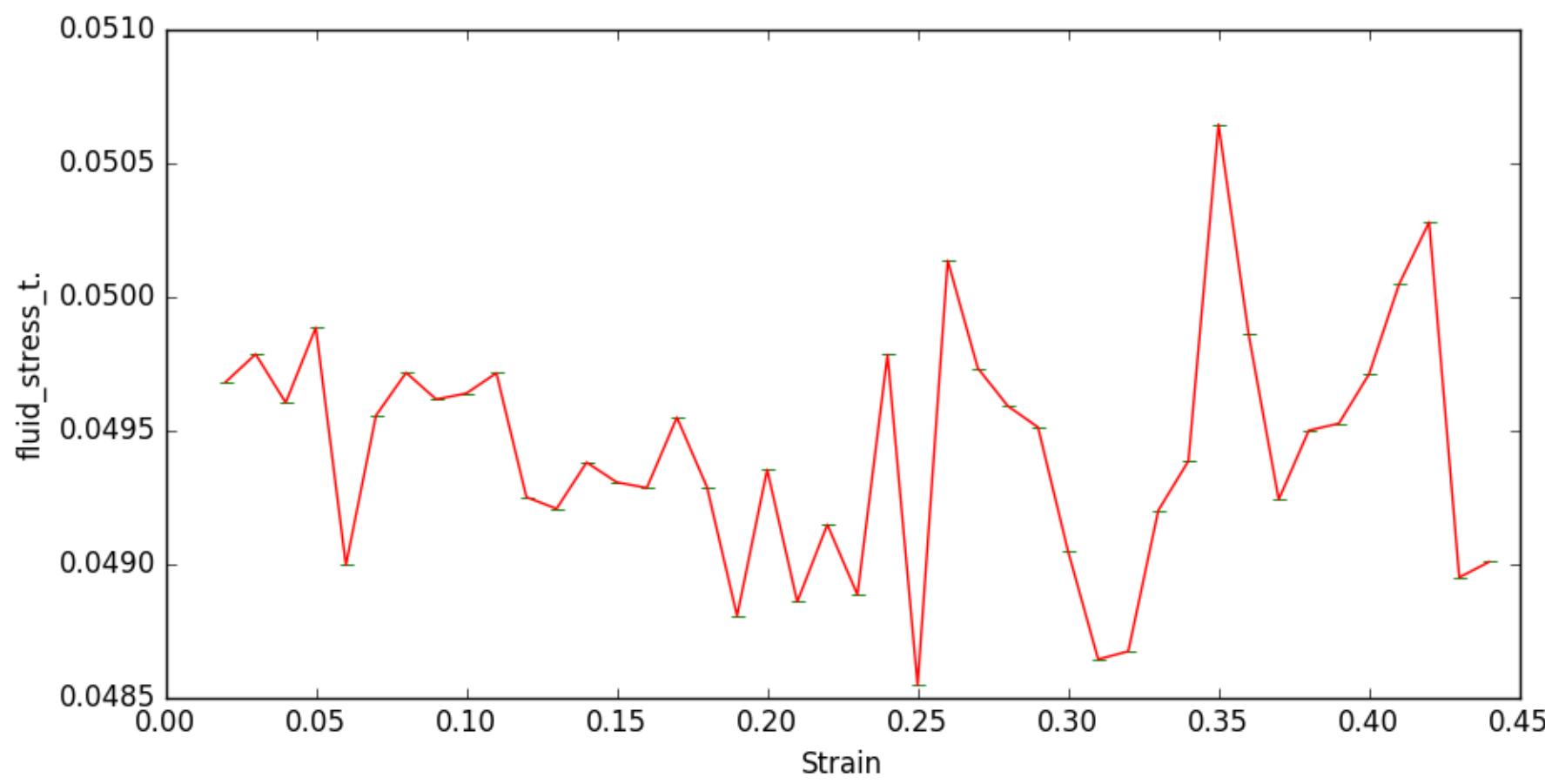
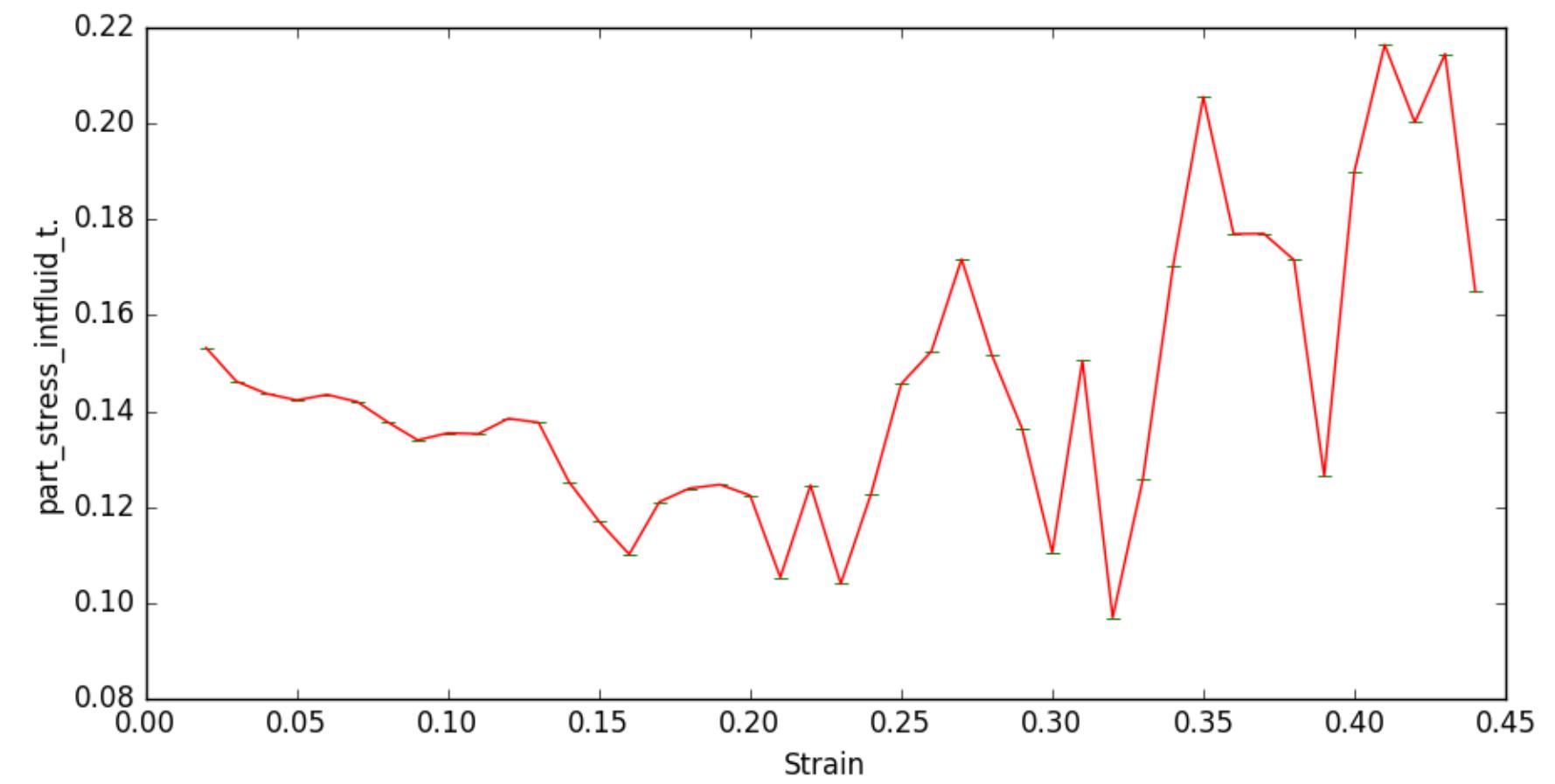
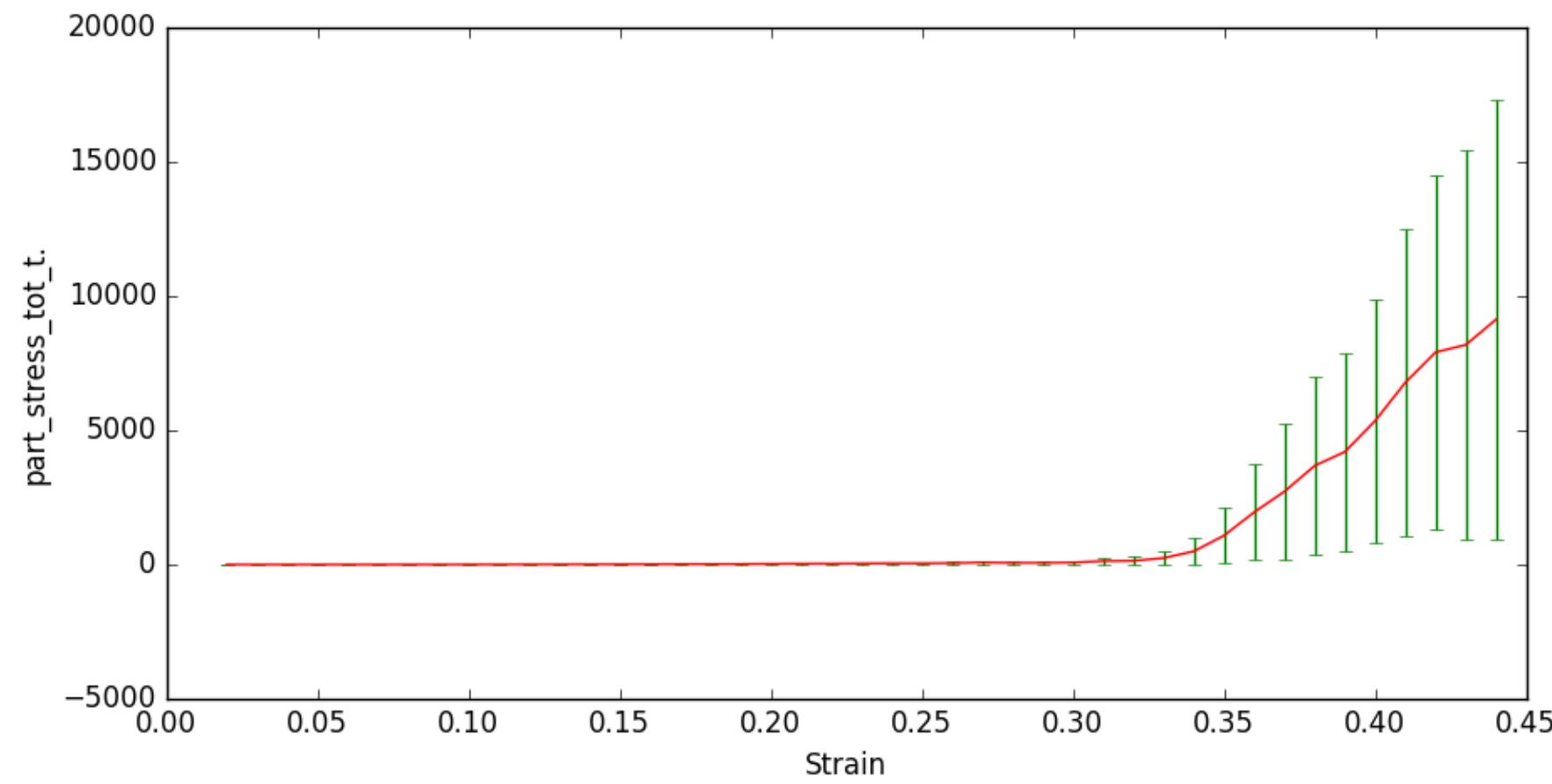


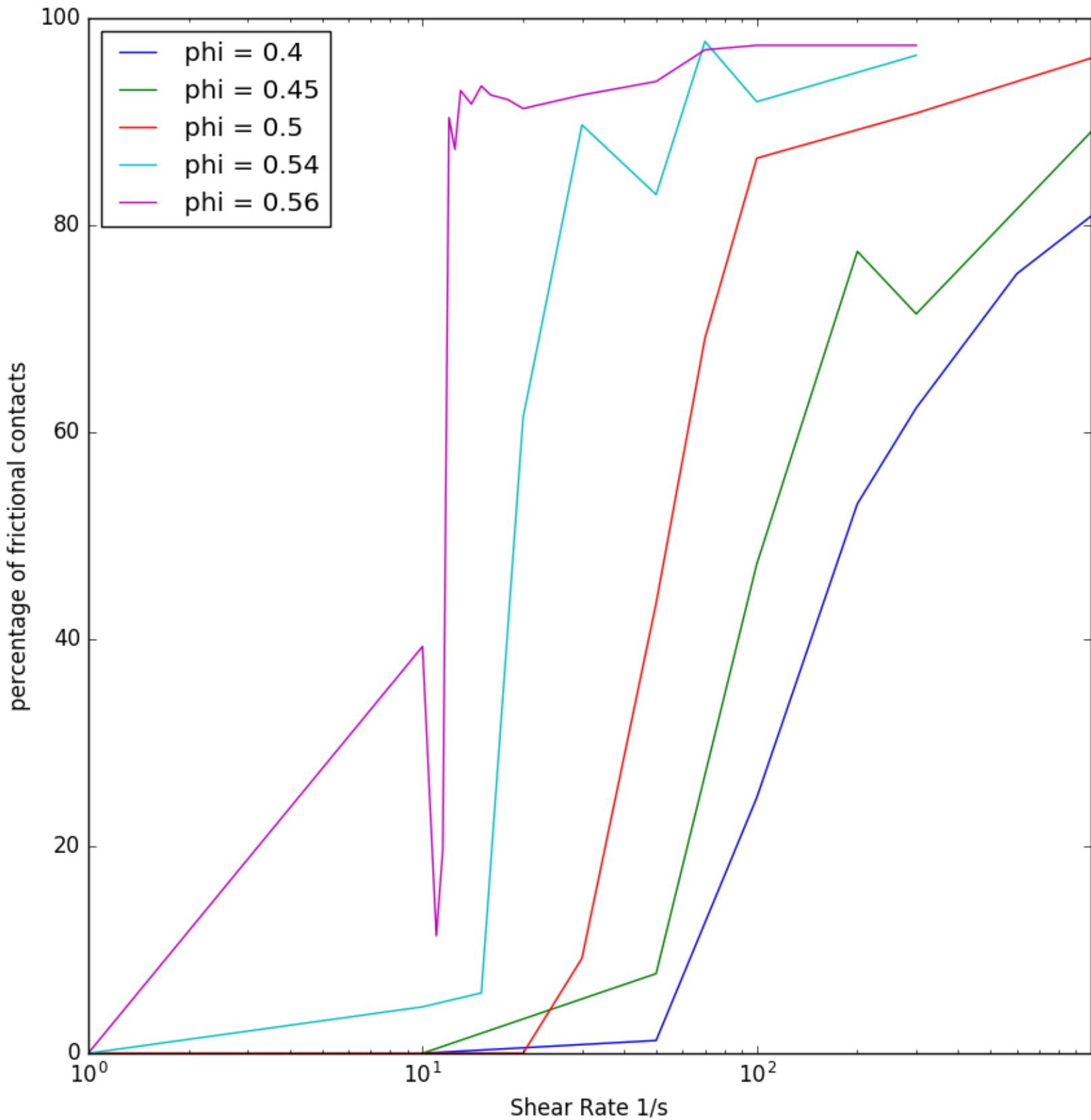


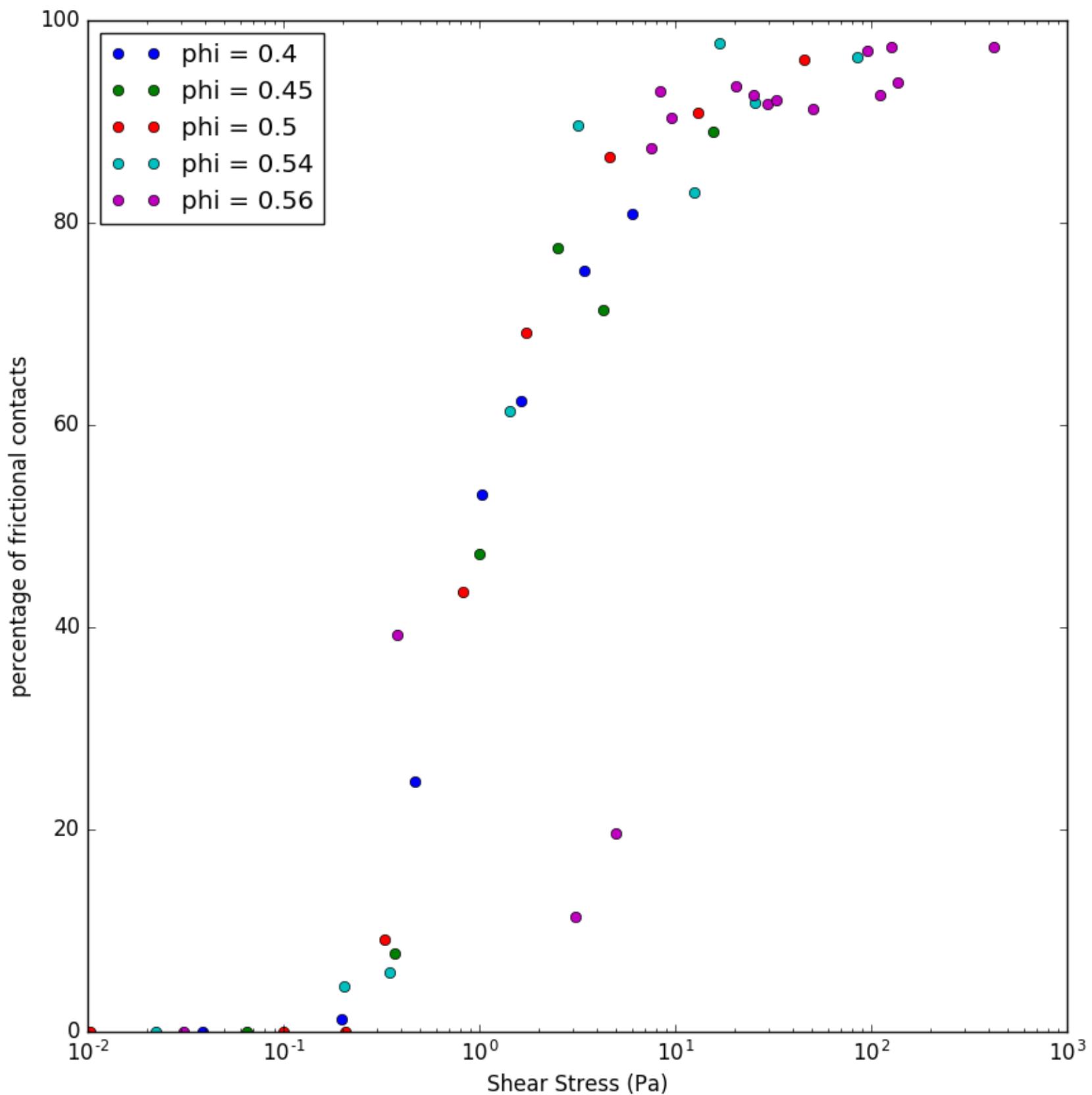




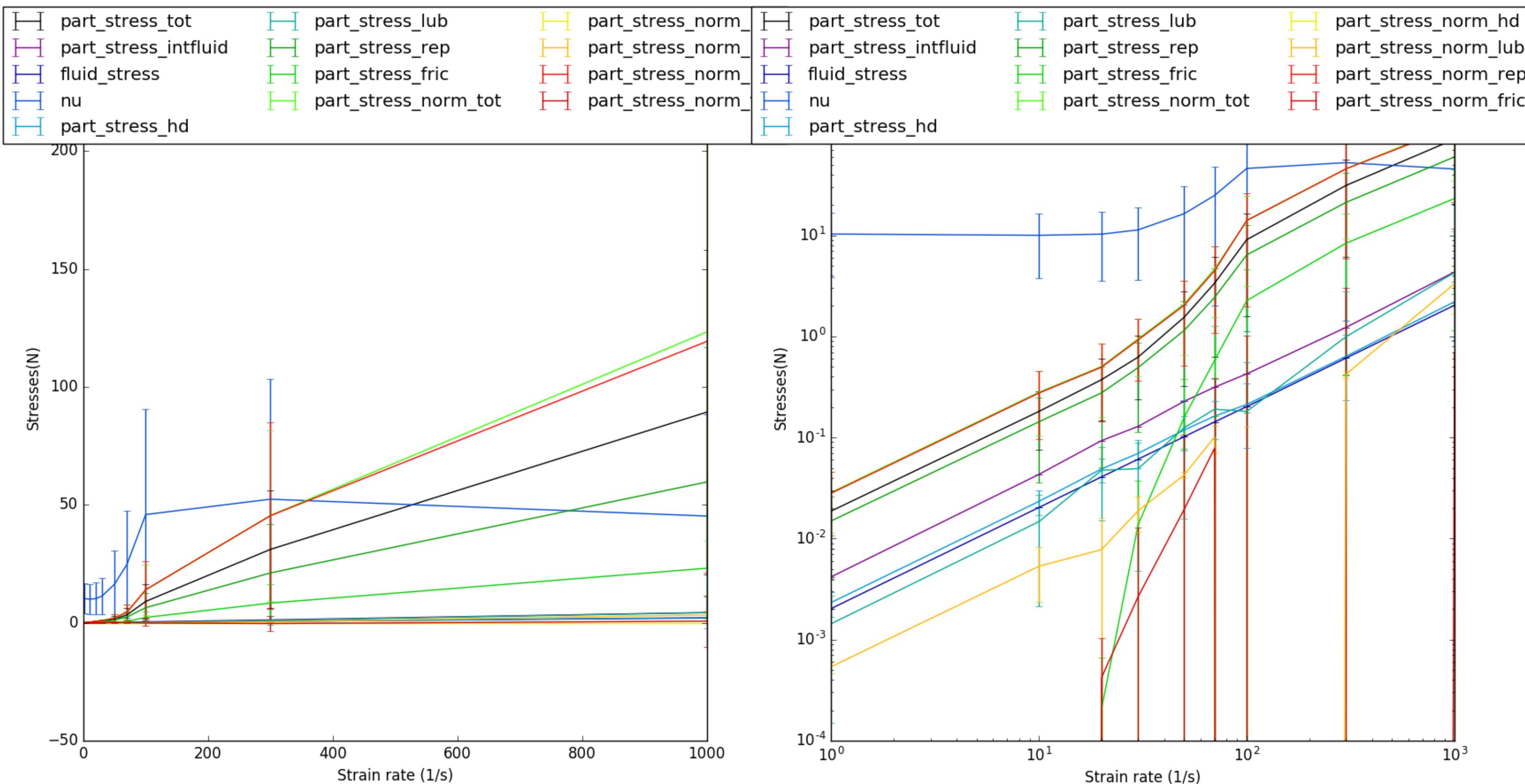




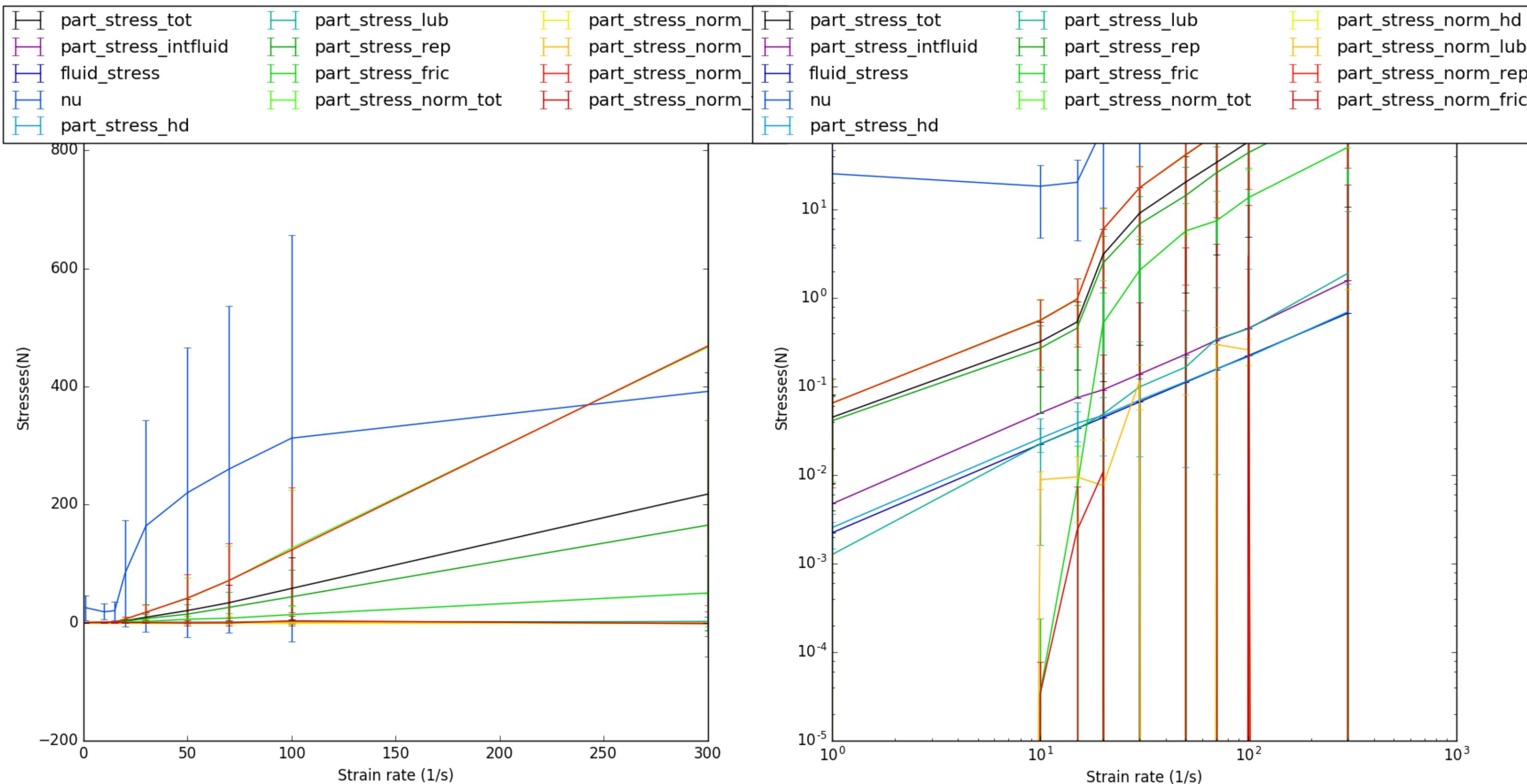




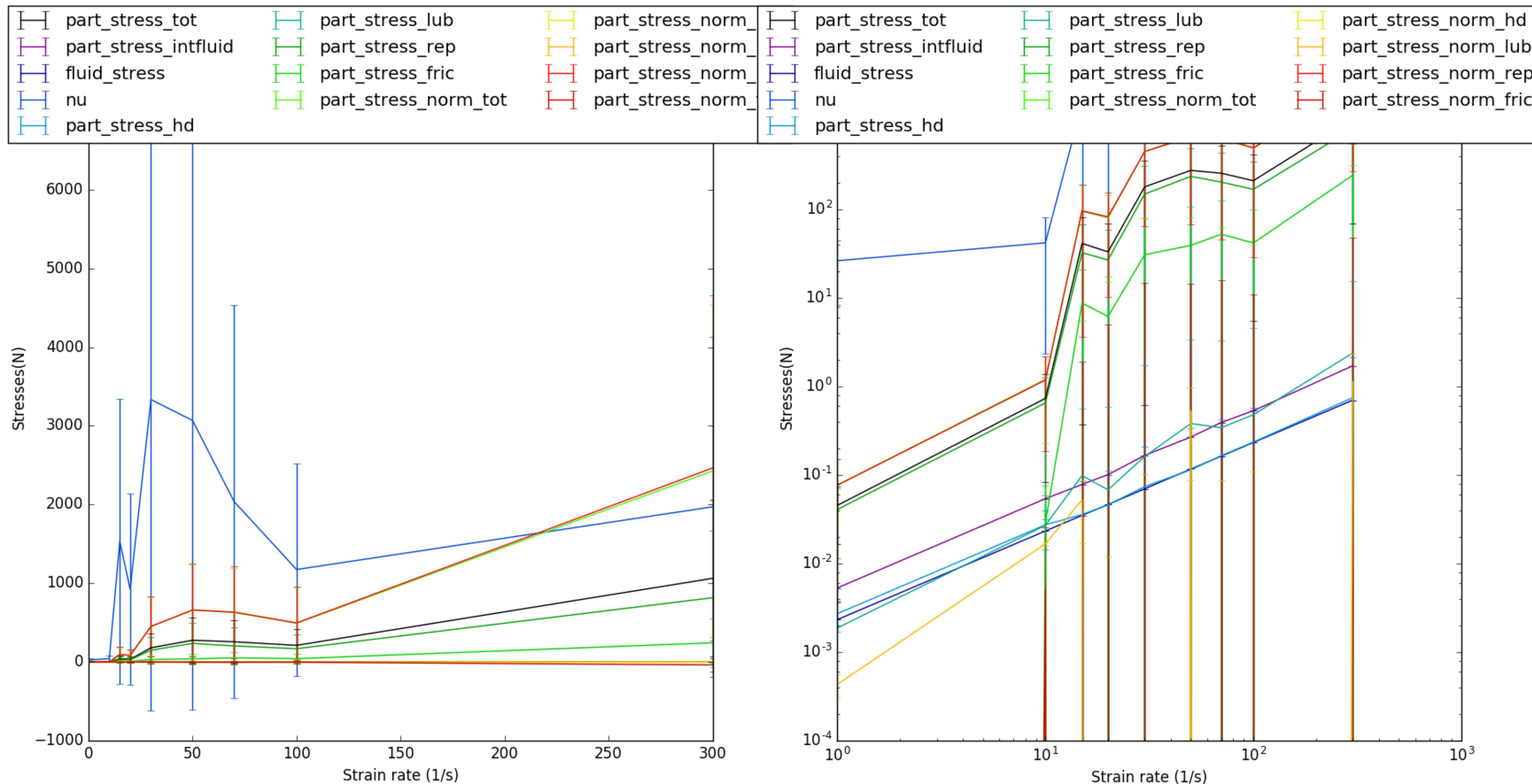
Stress evolution over shear rate for phi=50 ---- left(linear Scale), Right(log Scale)



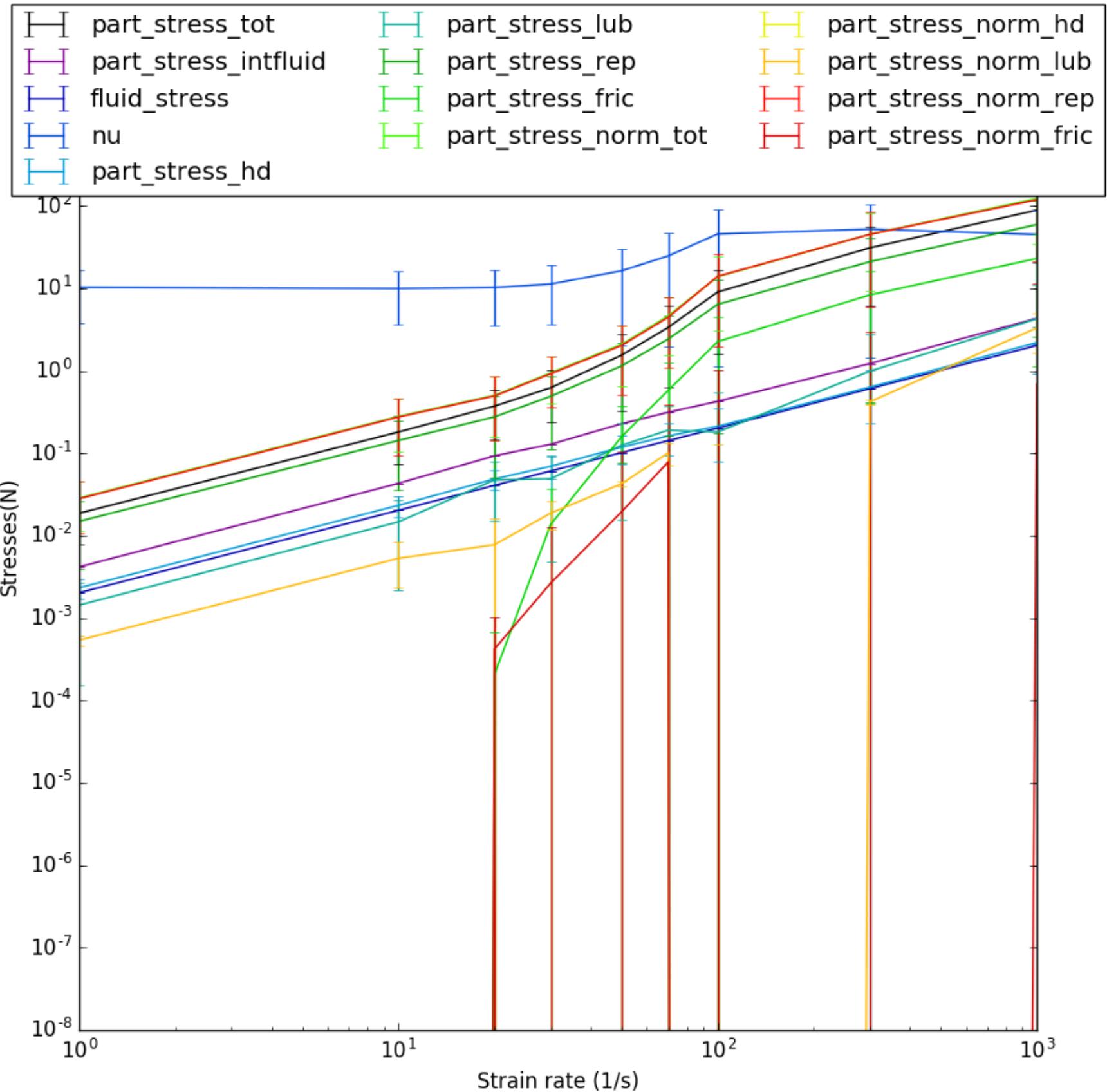
Stress evolution over shear rate for phi=54 ---- left(linear Scale), Right(log Scale)



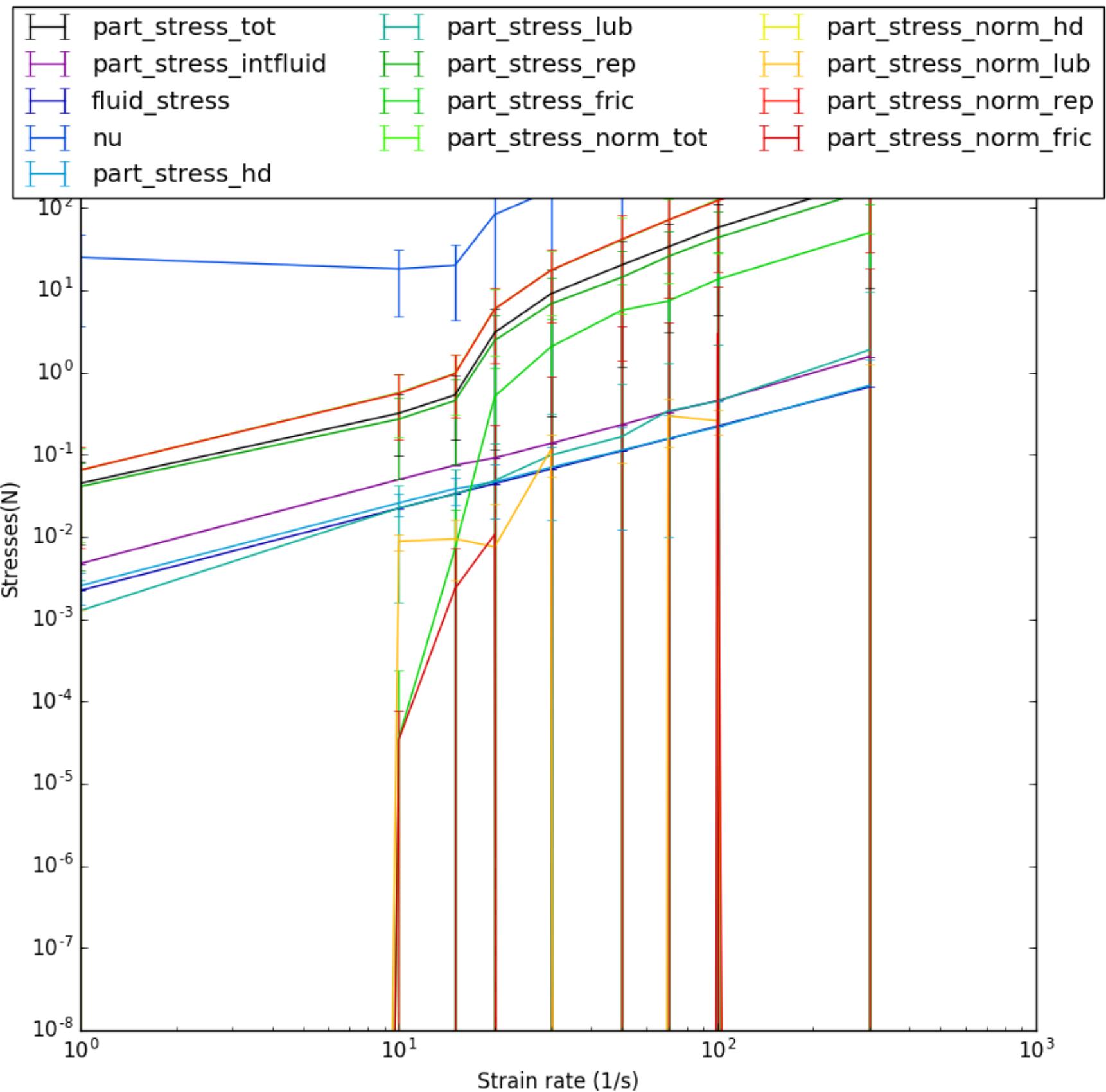
### Stress evolution over shear rate for phi=56 ---- left(linear Scale), Right(log Scale)



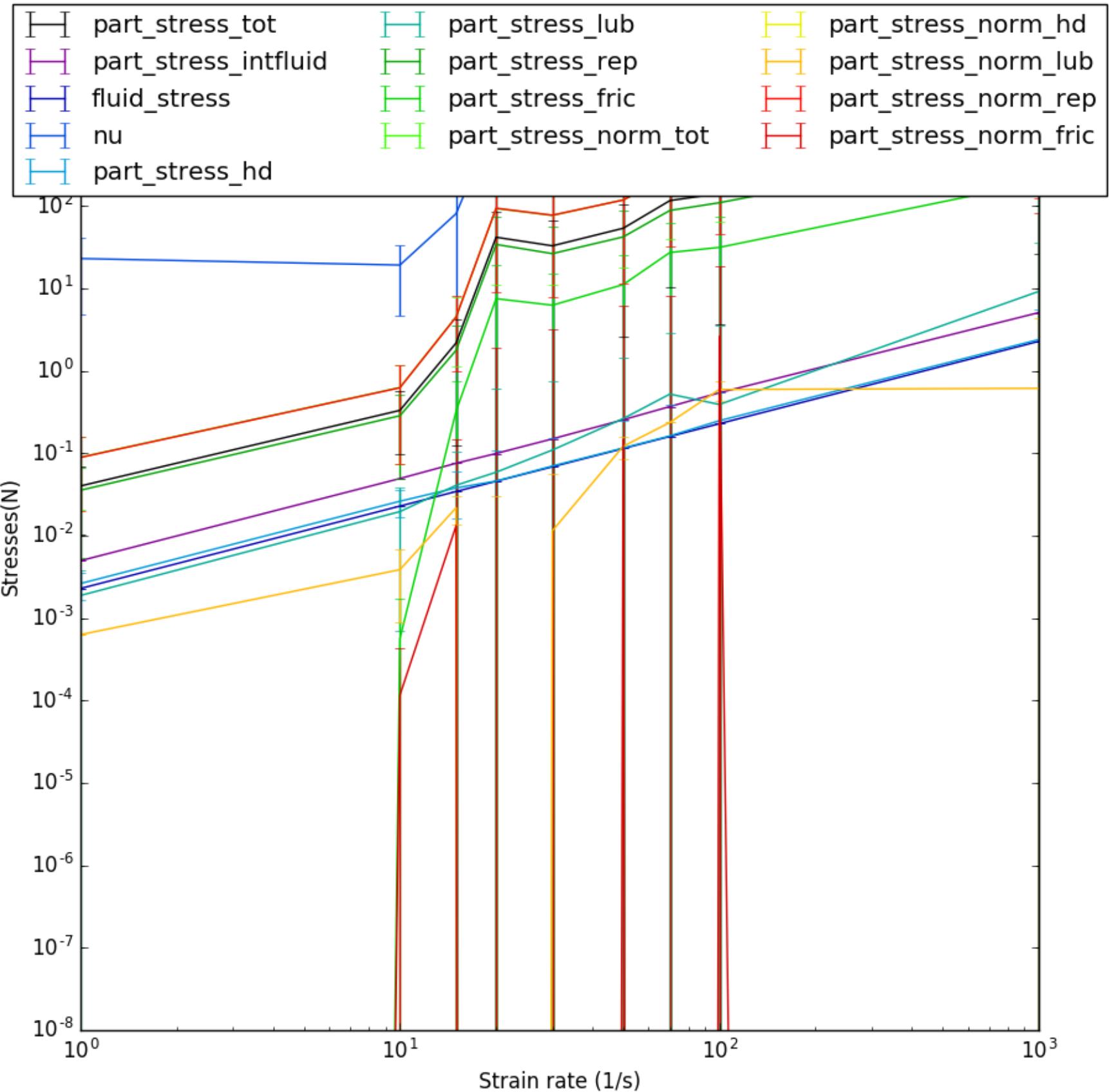
# Stress evolution over shear rate for phi=50



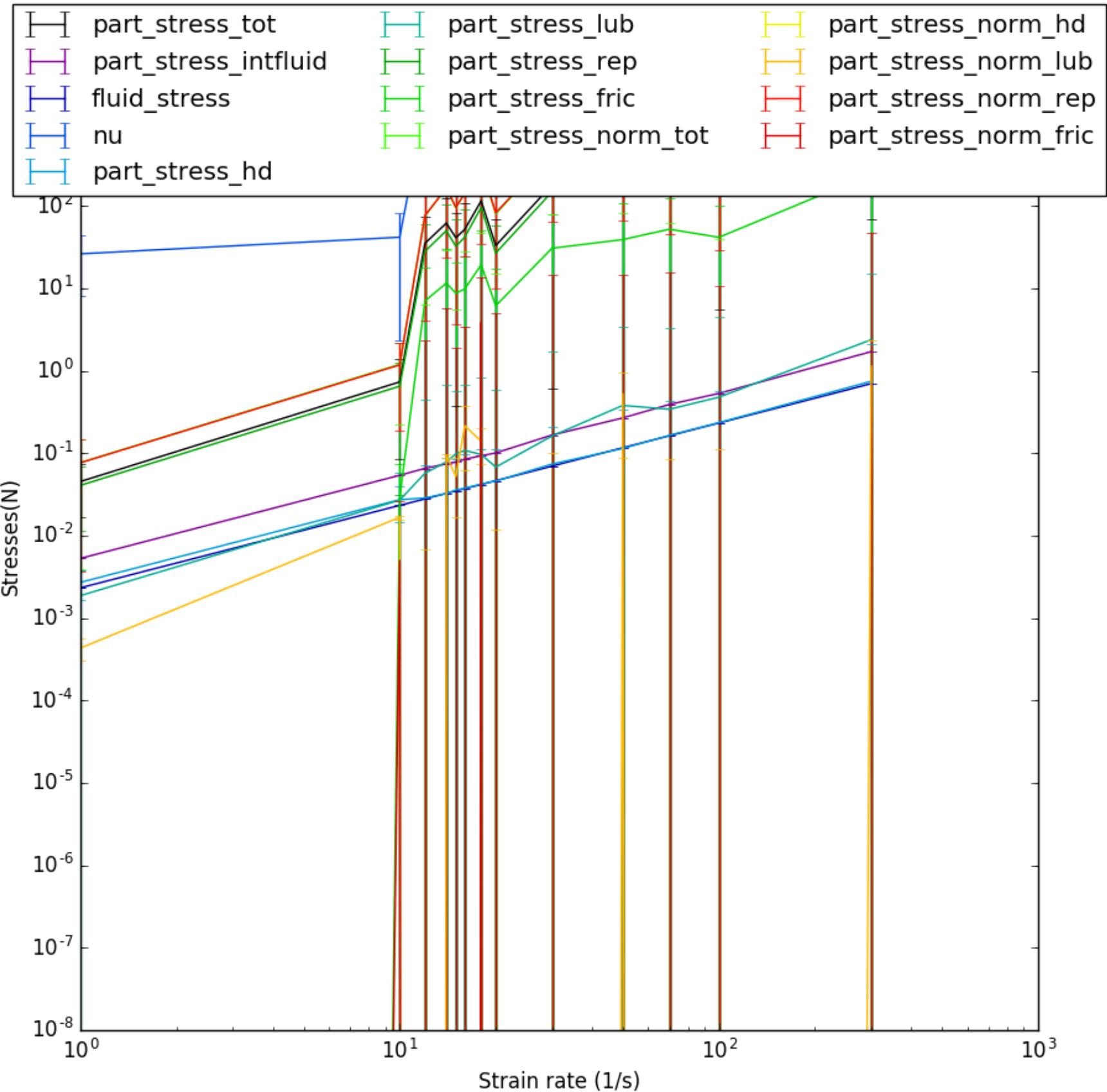
# Stress evolution over shear rate for phi=54



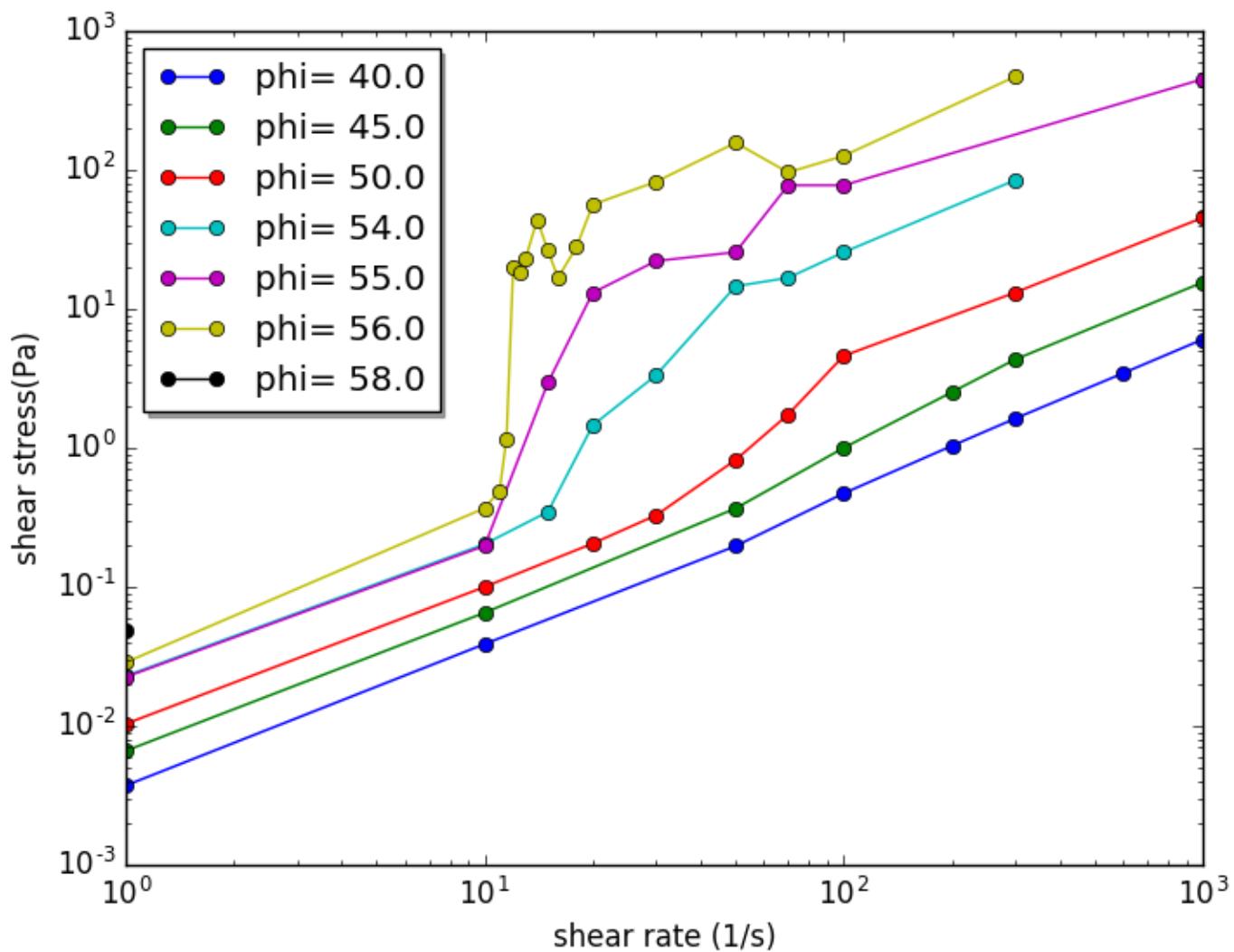
# Stress evolution over shear rate for phi=55



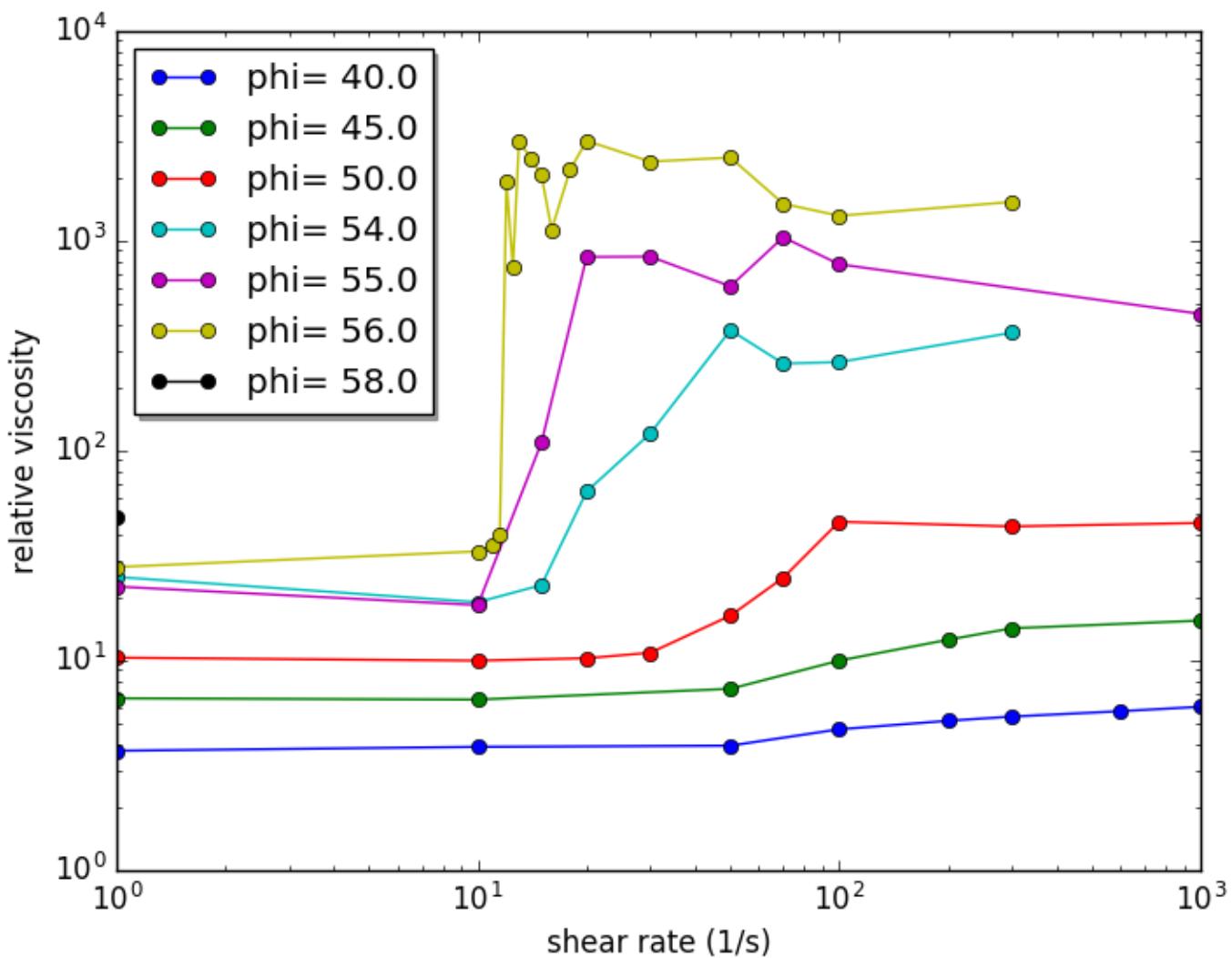
# Stress evolution over shear rate for phi=56

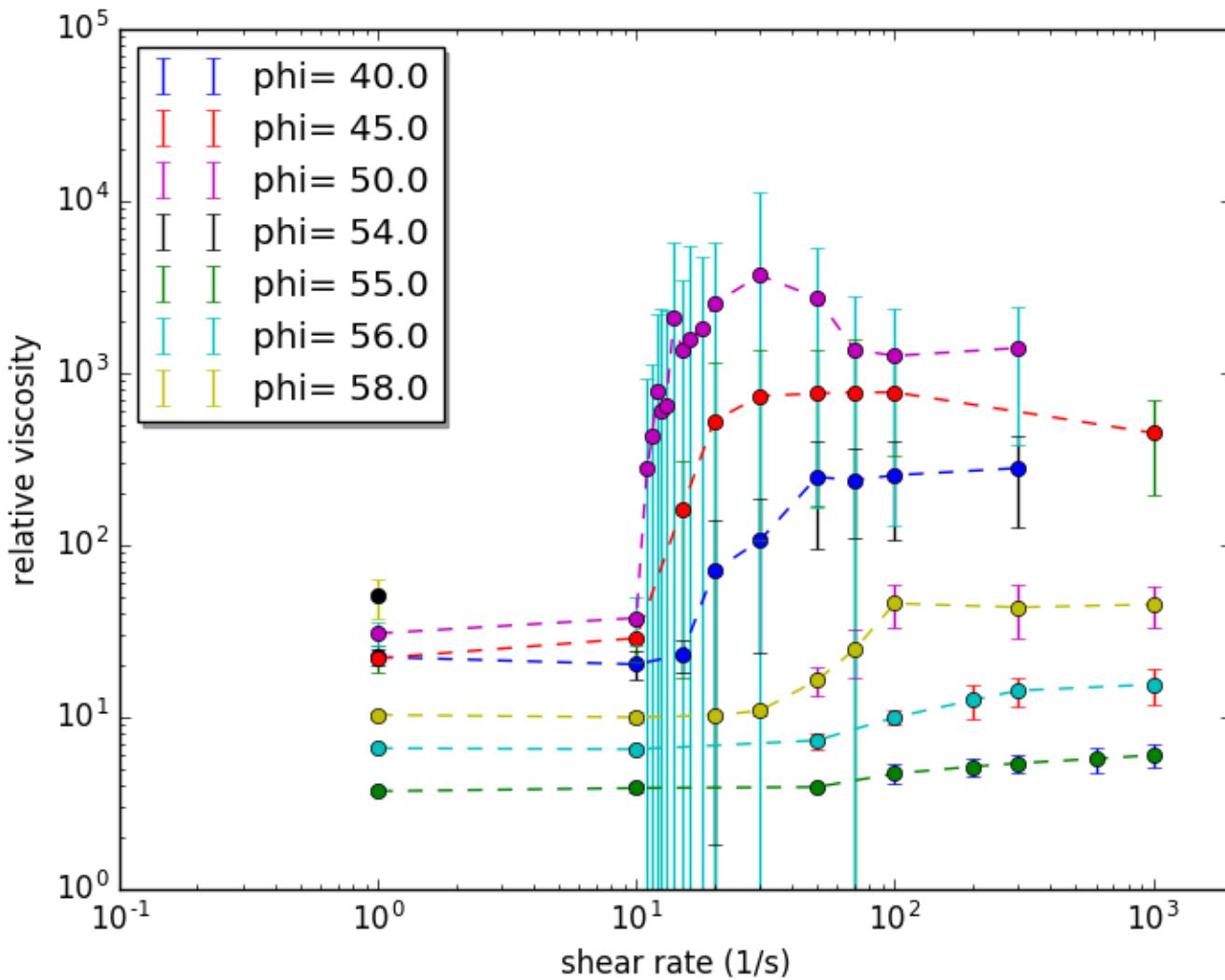


shearstress\_vs\_shearrate



viscosity\_vs\_shearrate





viscosity\_vs\_shearstress

