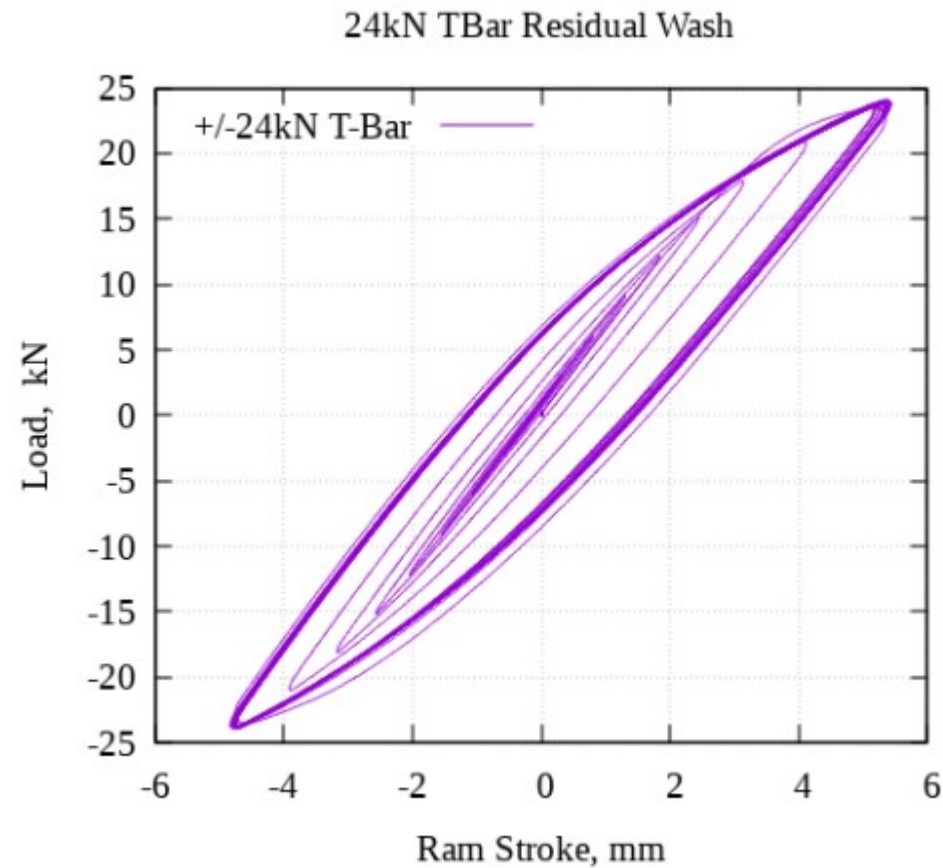
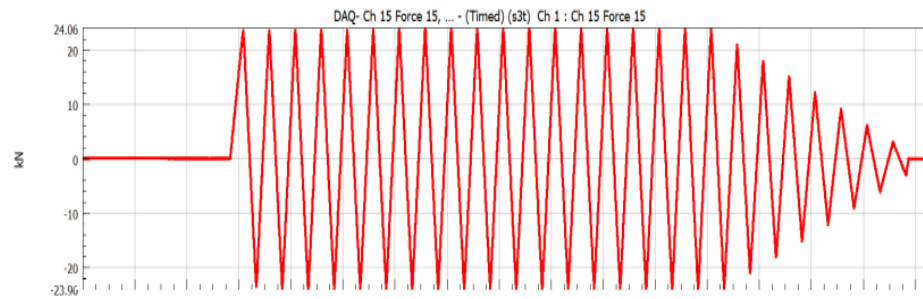


# To Taper or Not To Taper



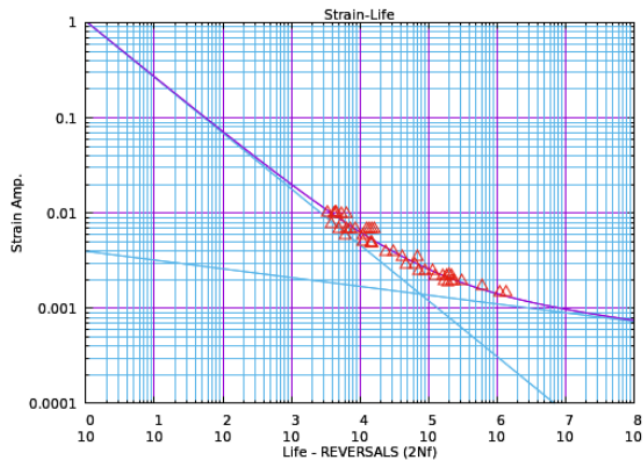
F.A. Conle  
U. Waterloo  
presented to  
F.D.&E  
Nov. 2 2022  
Ames, Iowa



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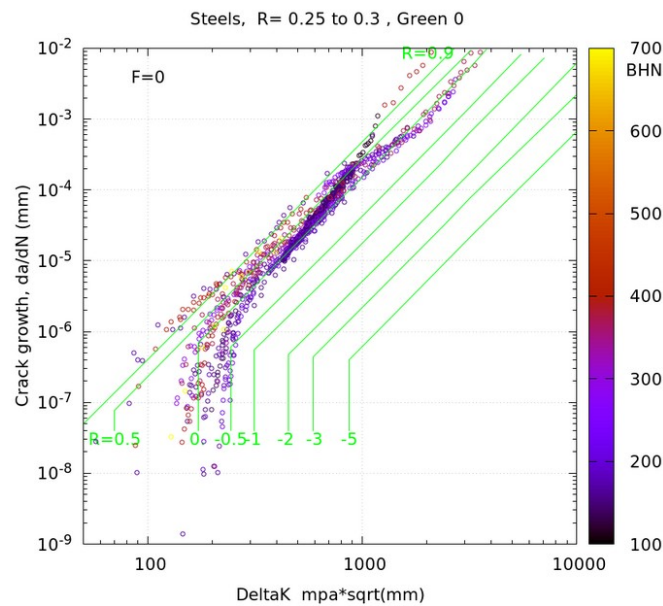
<http://creativecommons.org/licenses/by-sa/4.0/>

# Introduction The TBar test series

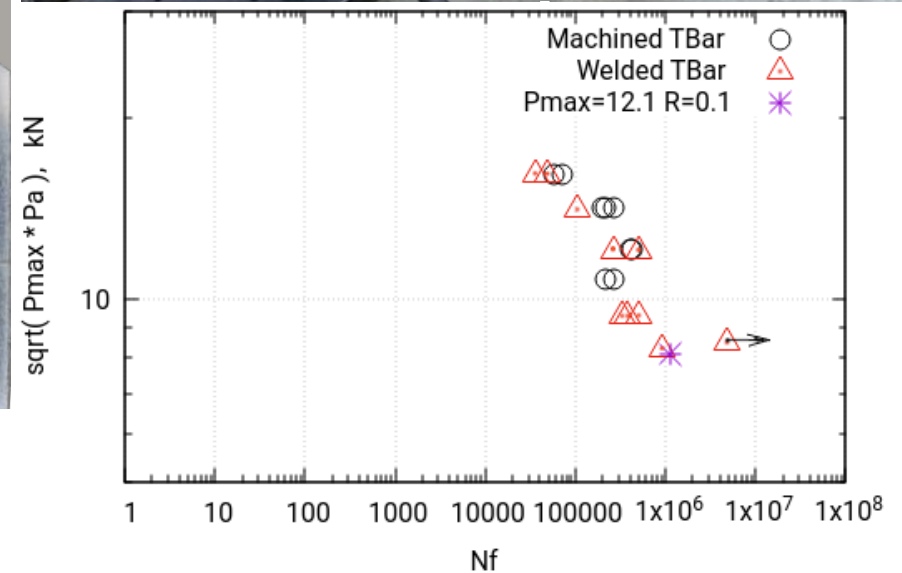


F.D.+E. da/dN Curves from UoWaterloo Site

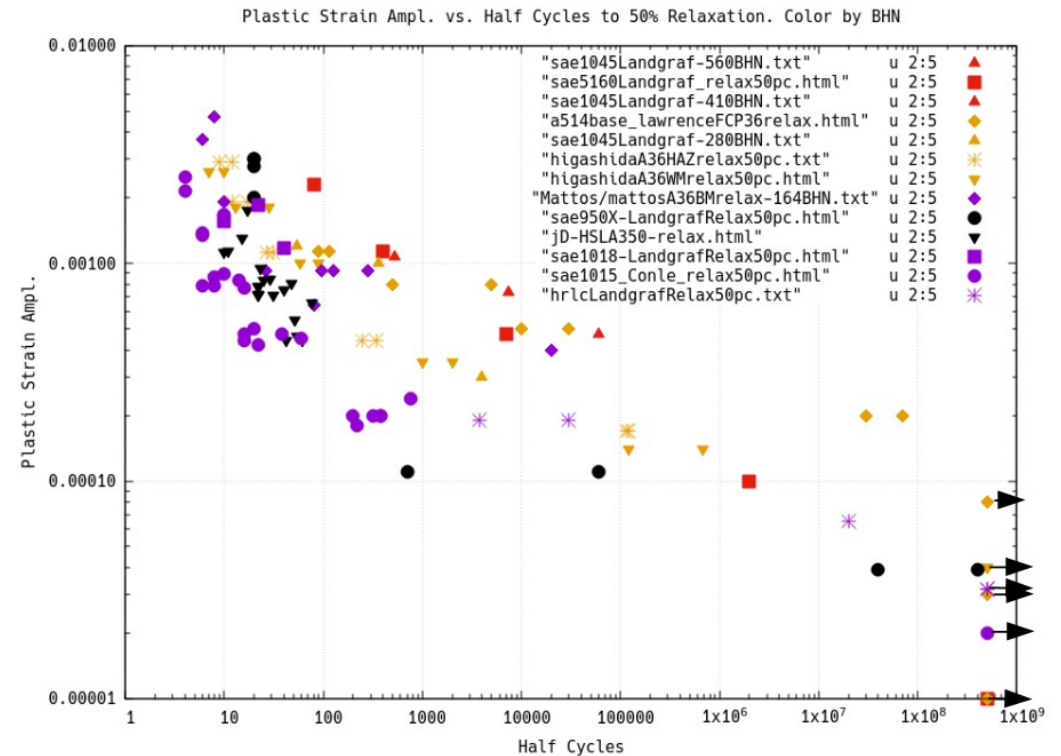
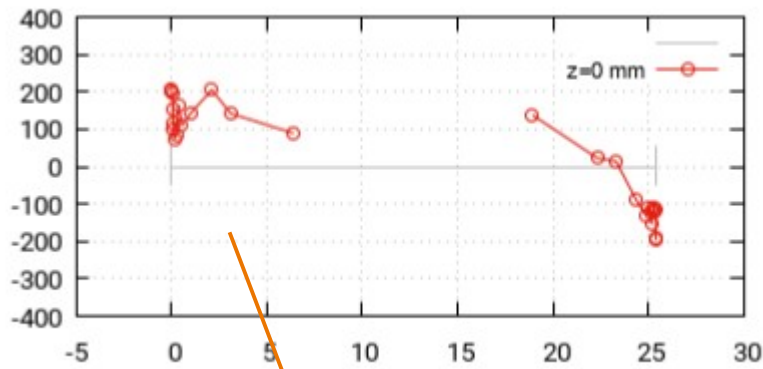
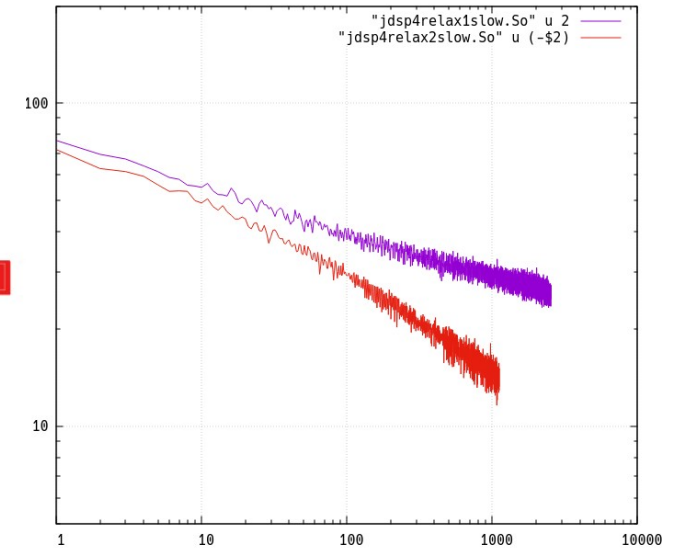
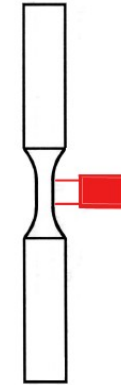
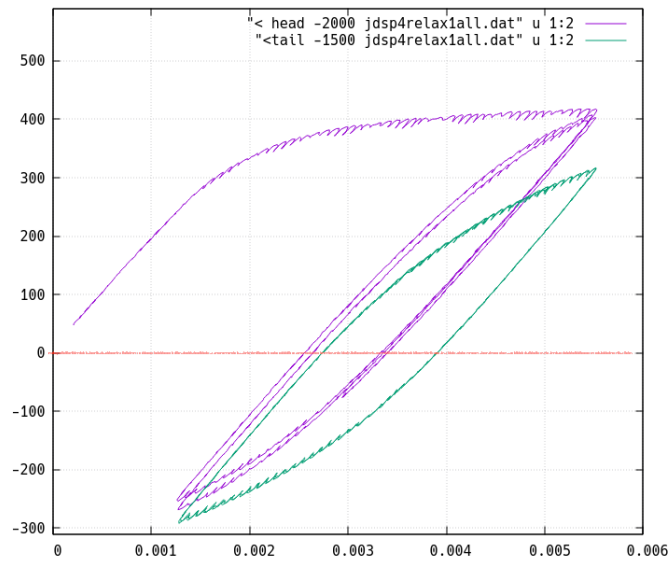
Mon Jun 13 13:57:45 EDT 2022



#Descriptions of Files  
 # Ref.: R= 0.30 BHN= 110 Sy= 252, Su= 415, mpa No.= 318 ASTM-A36  
 # Ref.: ends  
 # Ref.: R= 0.30 BHN= 134 Sy= 281, Su= 449, mpa No.= 422 SM41B  
 # Ref.: ends  
 # Ref.: R= 0.30 BHN= 147 Sy= 262, Su= 496, mpa No.= 192 A36  
 # Ref.: ends  
 # Ref.: R= 0.30 BHN= 152 Sy= 460, Su= 595, mpa No.= 331 J15-SFV3, ASTM-A588-3  
 # Ref.: ends  
 # Ref.: R= 0.30 BHN= 154 Sy= 485, Su= 513, mpa No.= 143 G40.21H-350W

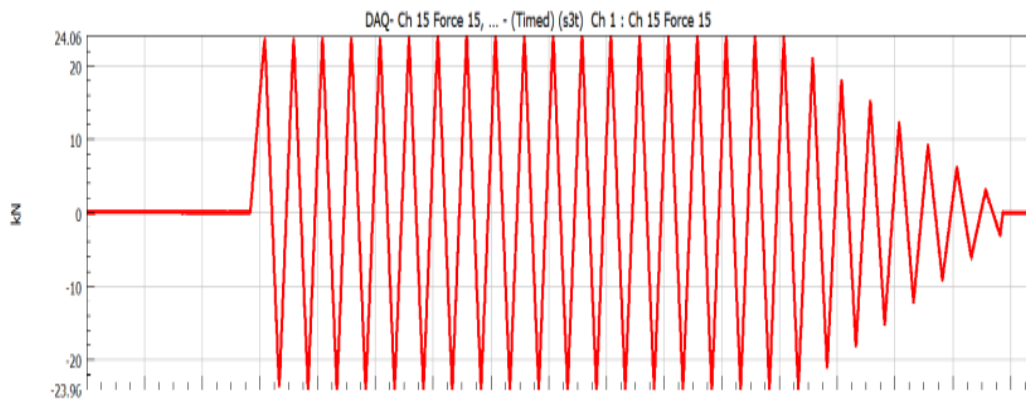
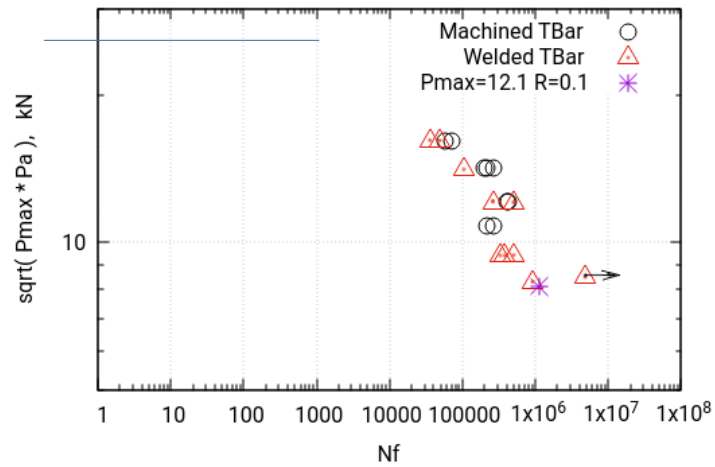


Does cyclic local plasticity alter initial Welding Residual stresses ?

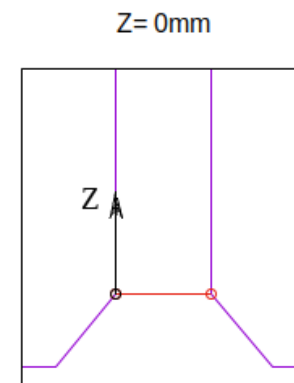
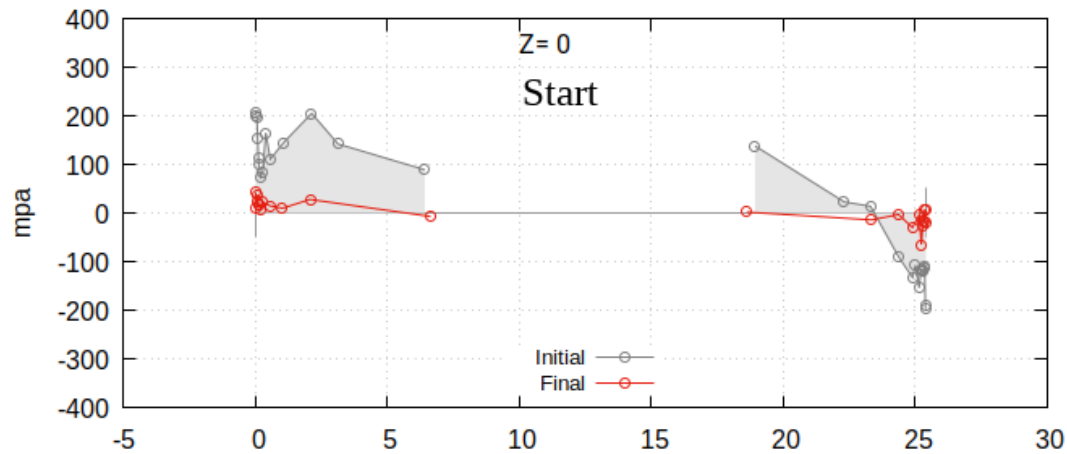
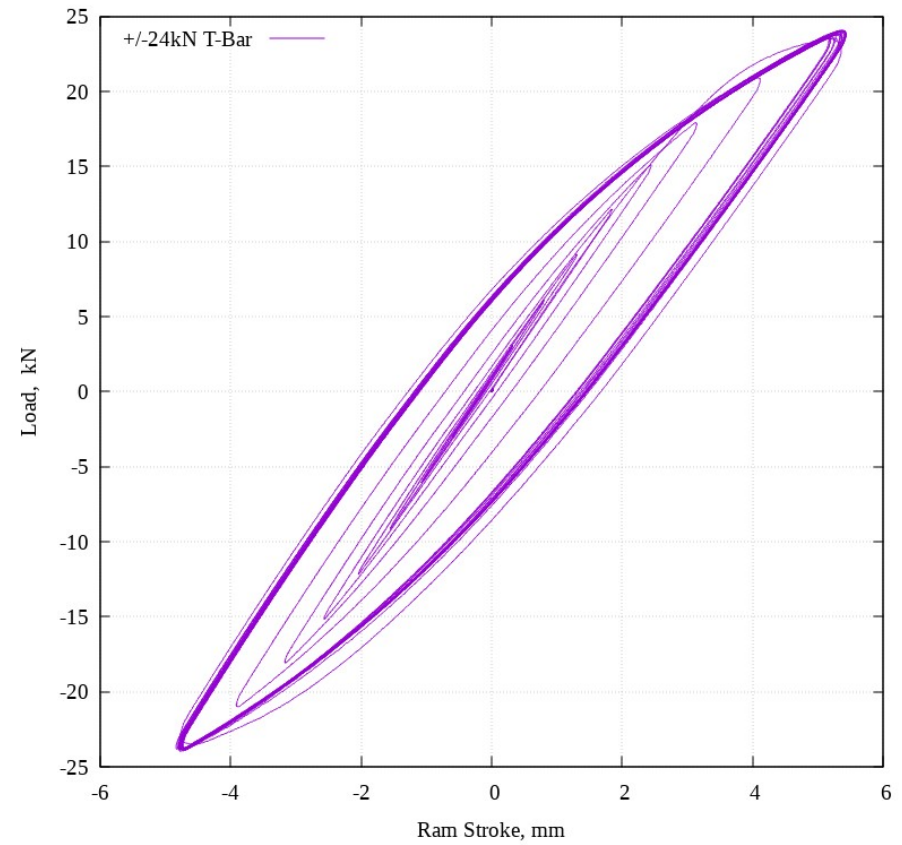




Test Life of "T" Specimens.

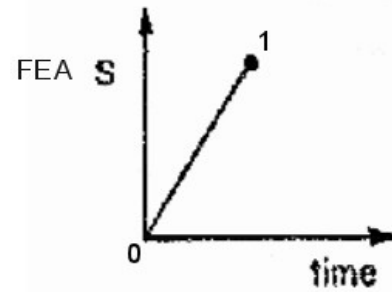
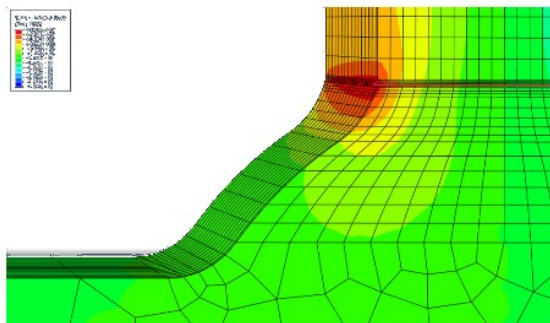
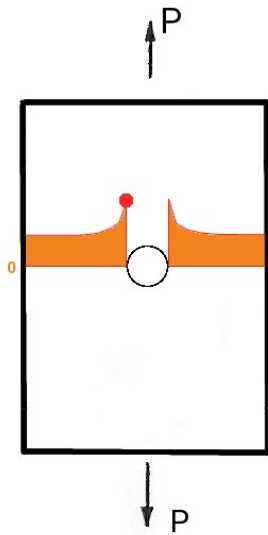


24kN TBar Residual Wash

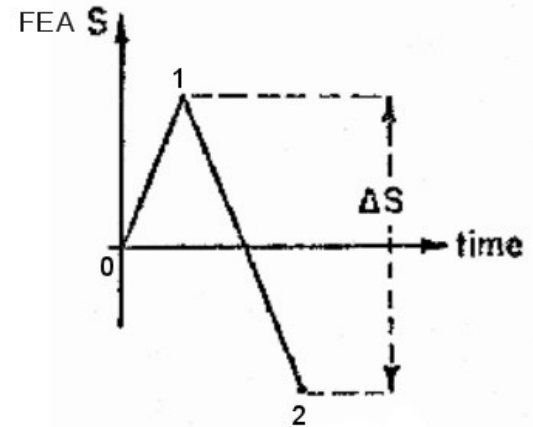
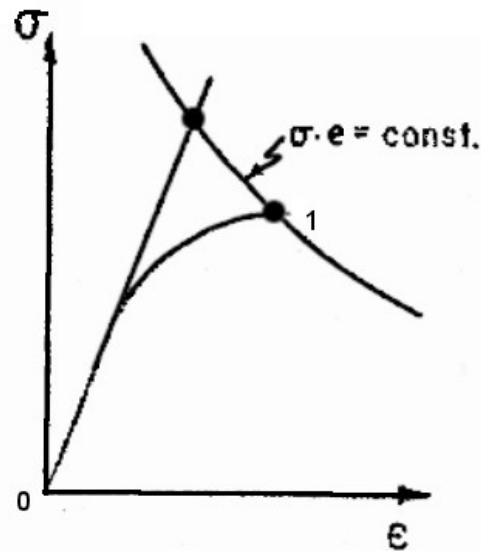


# Introduction

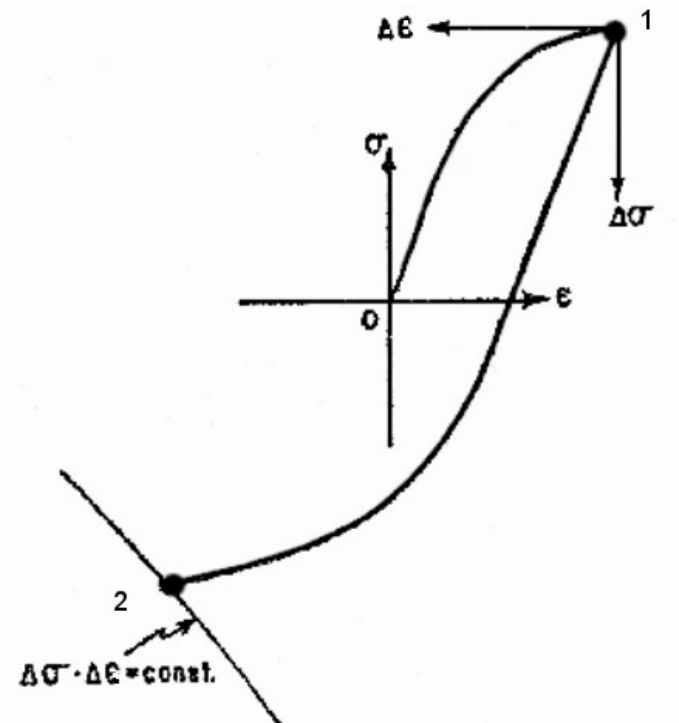
## Elastic Analysis & Plasticity Corrections



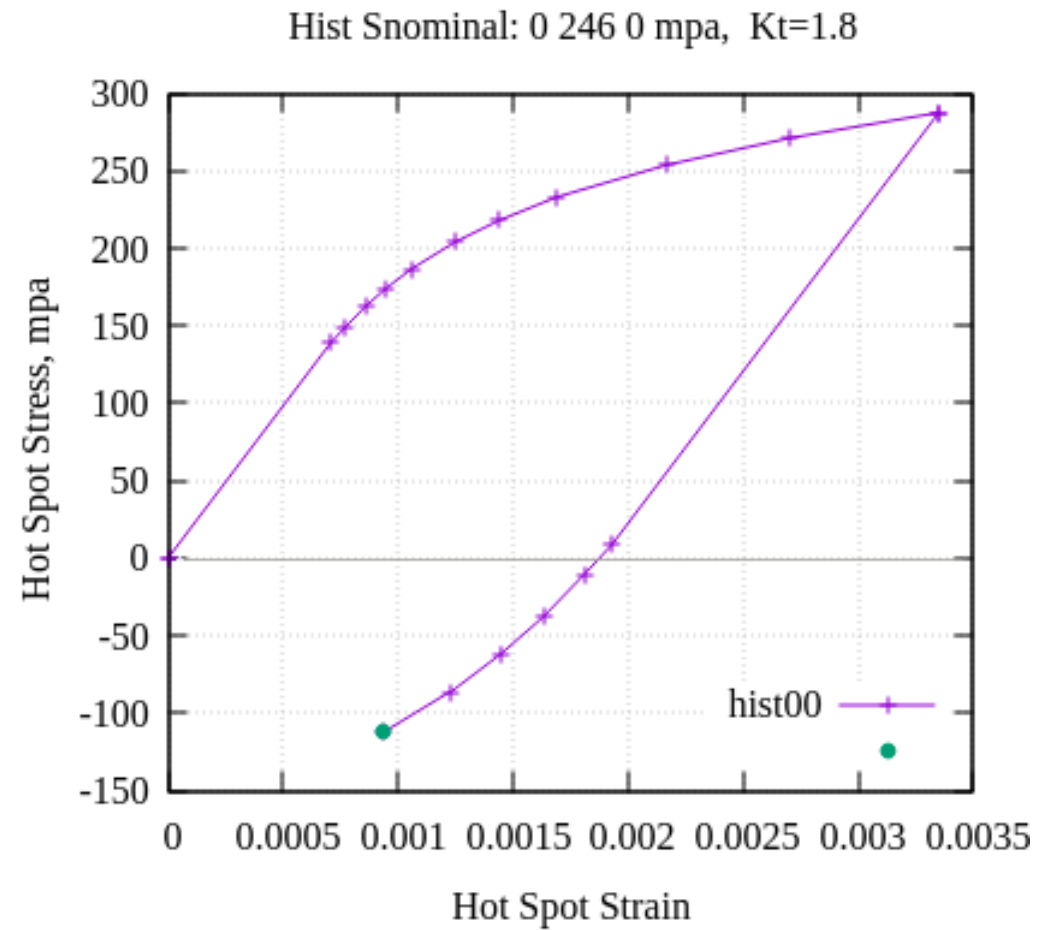
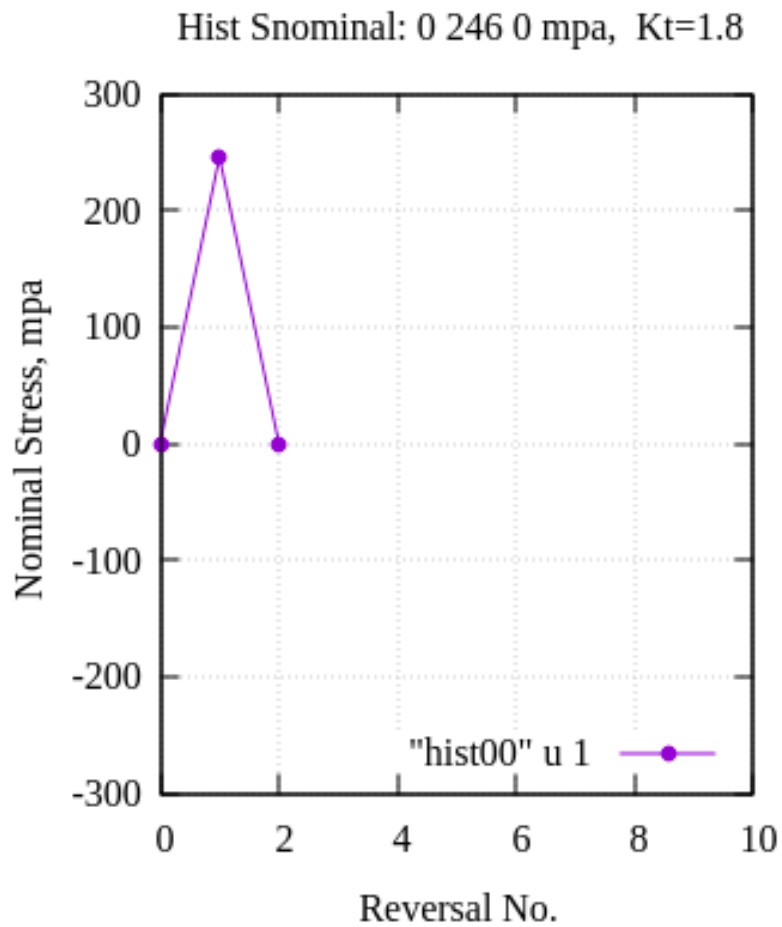
$$S * e = S * \frac{S}{E} = \text{Constant}$$

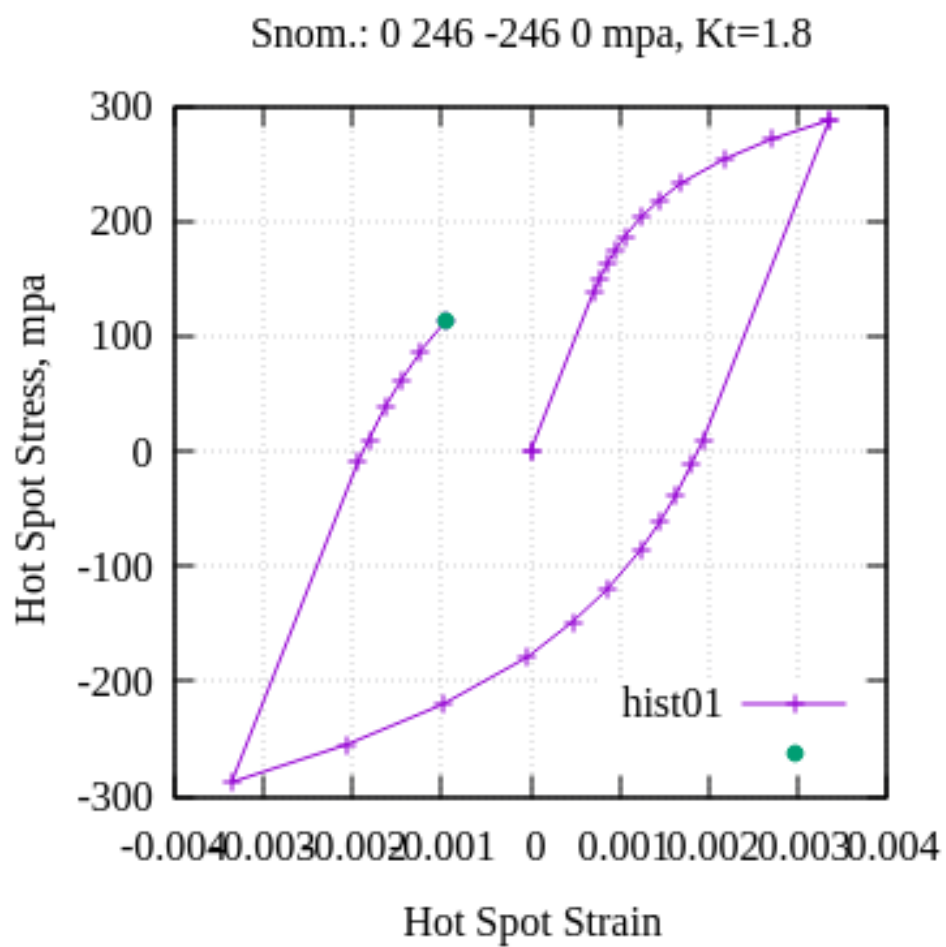
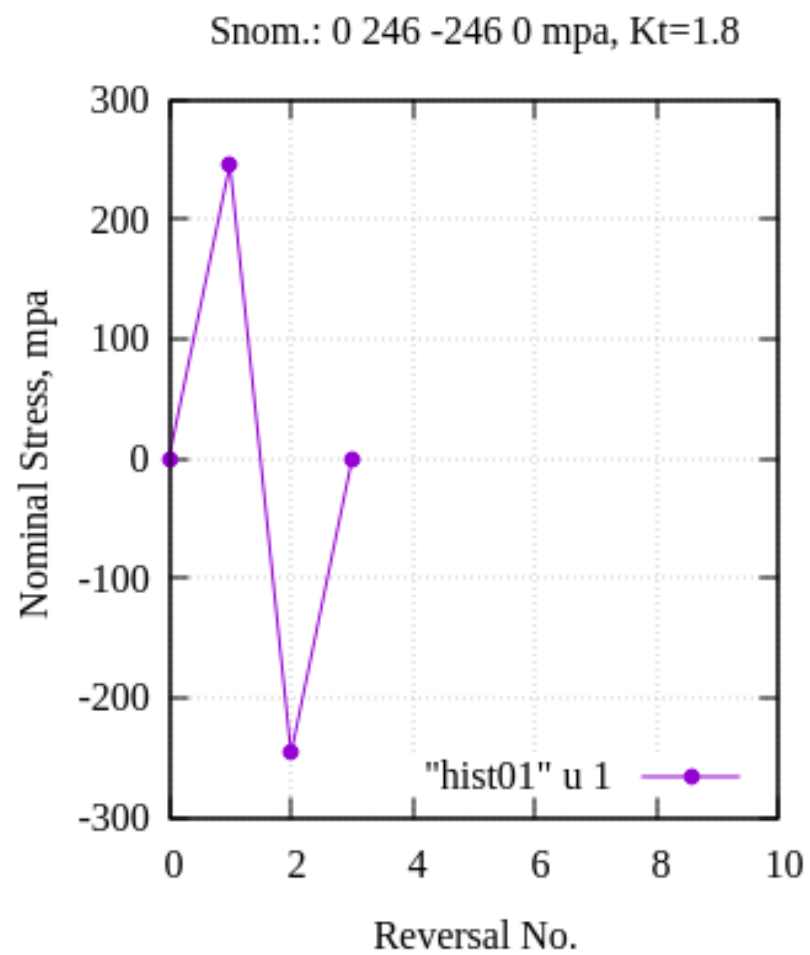


$$\Delta S * \frac{\Delta S}{E} = \text{constant} = \Delta \sigma * \Delta \epsilon$$

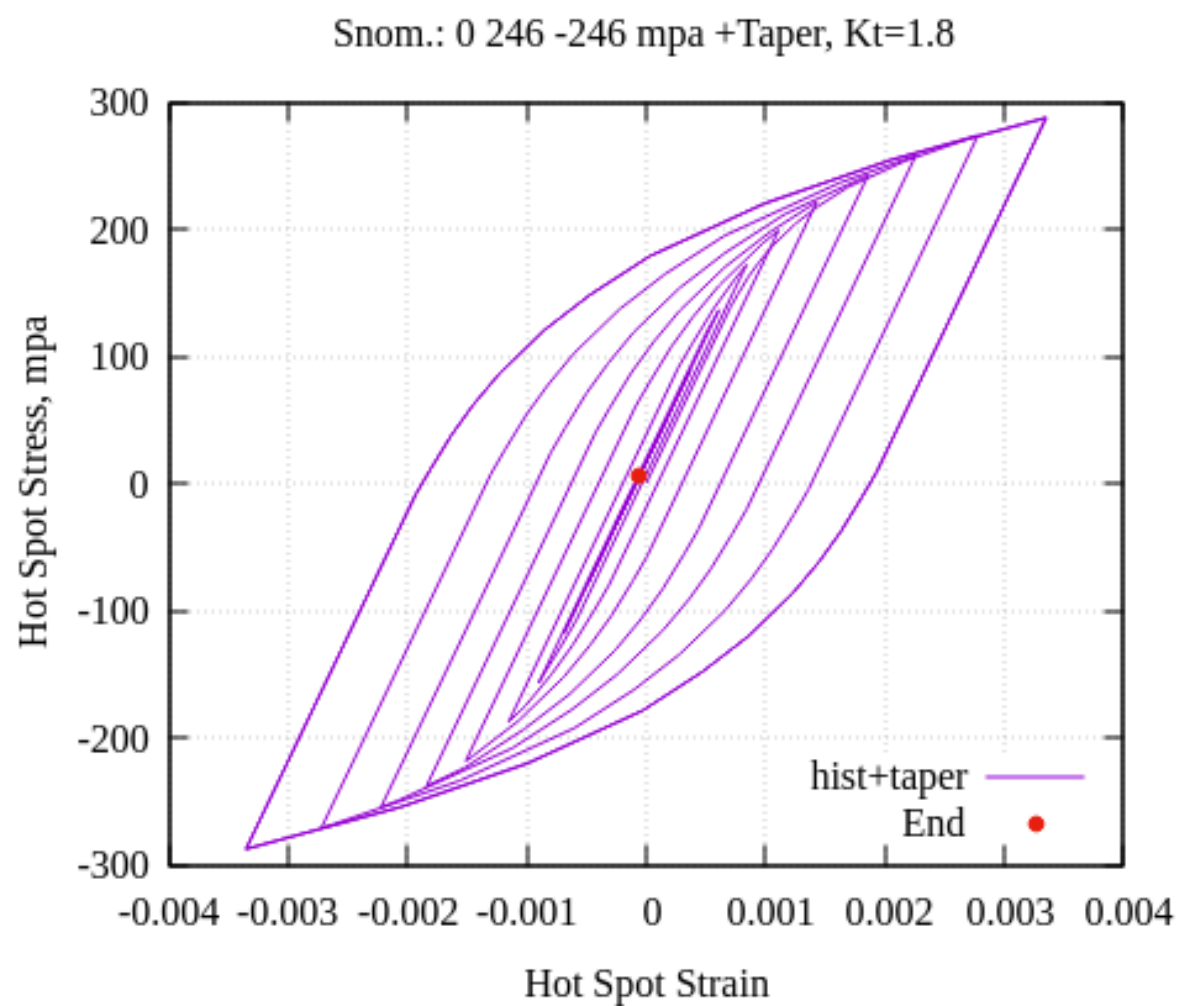
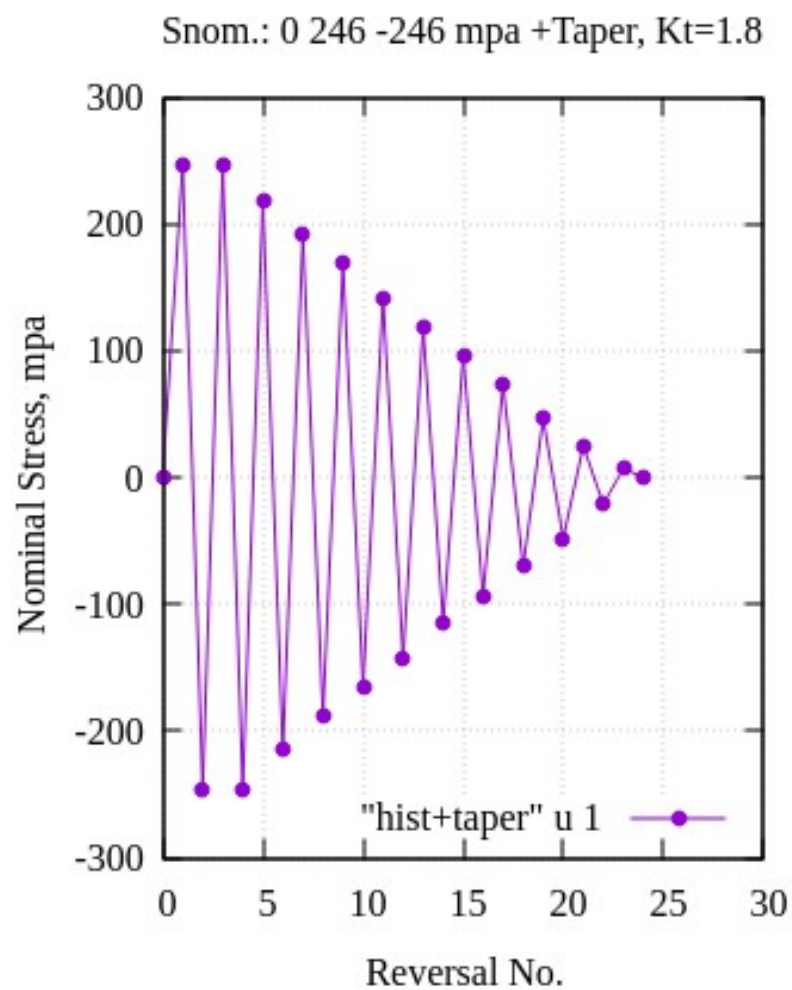


What happens with No Taper ?



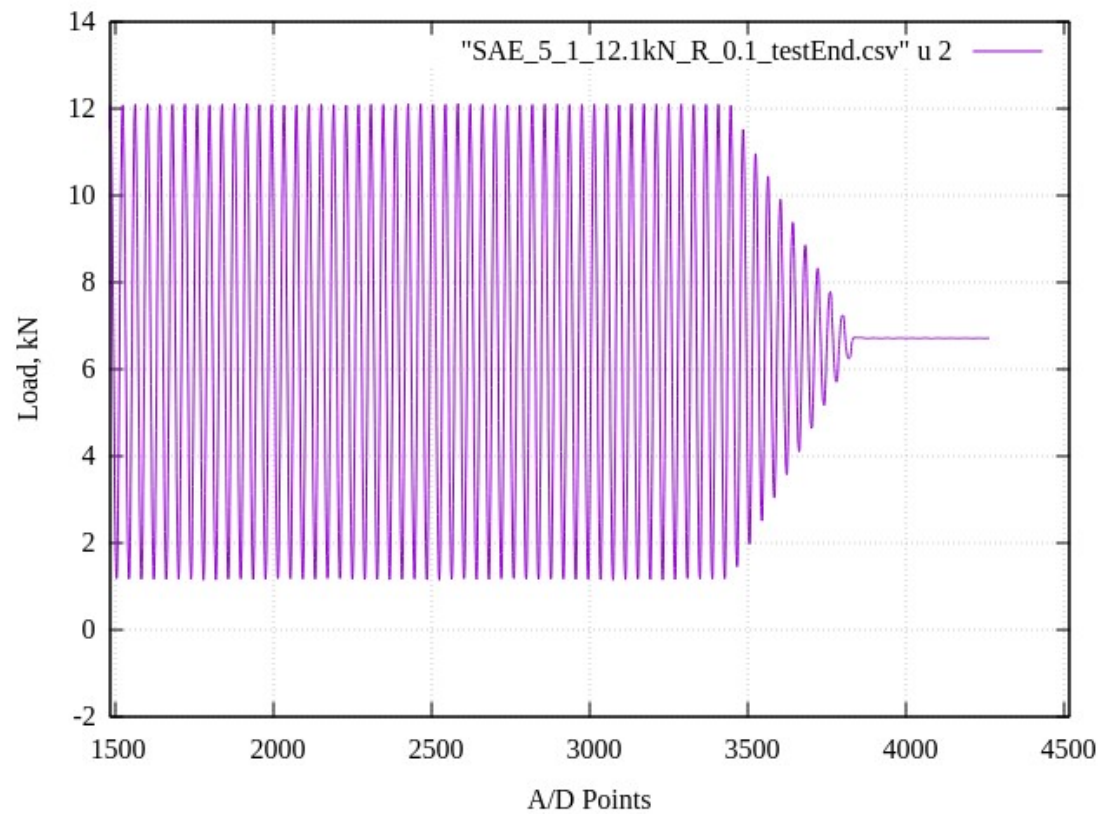
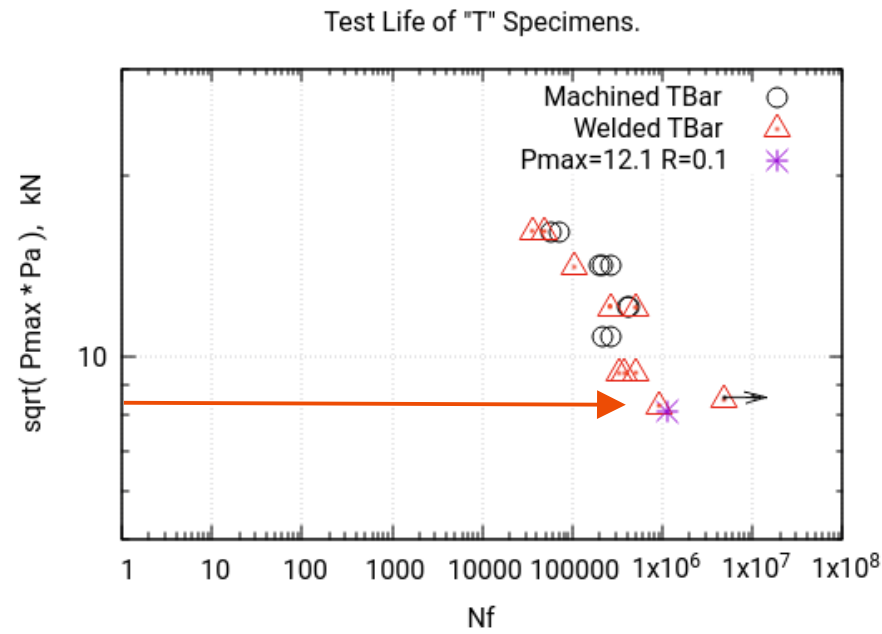


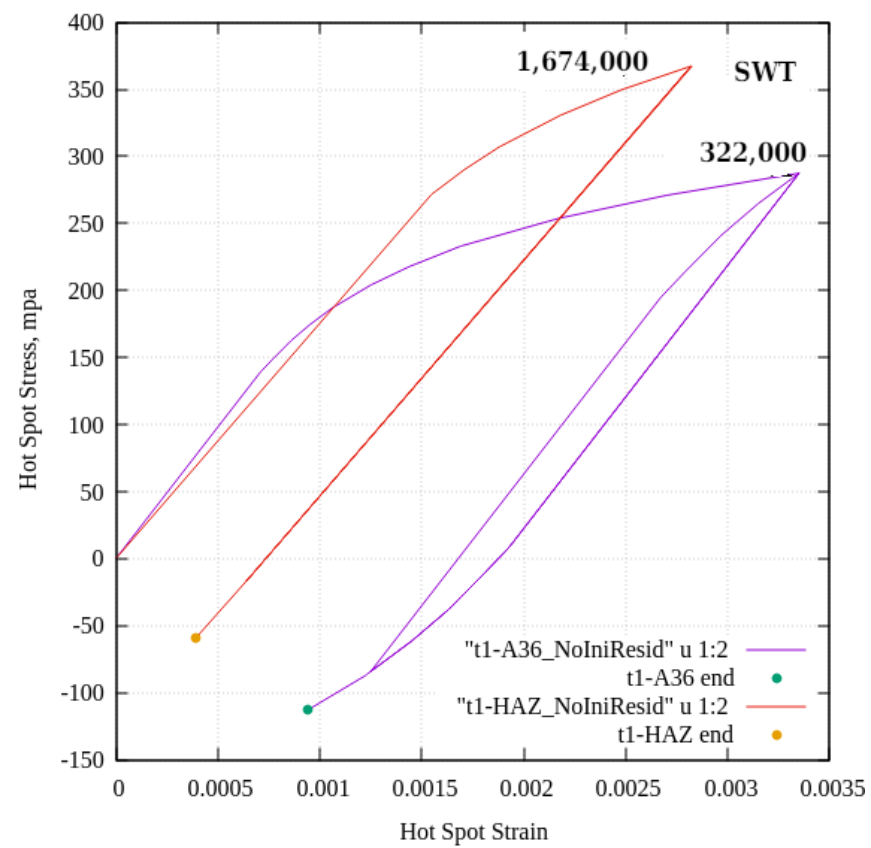
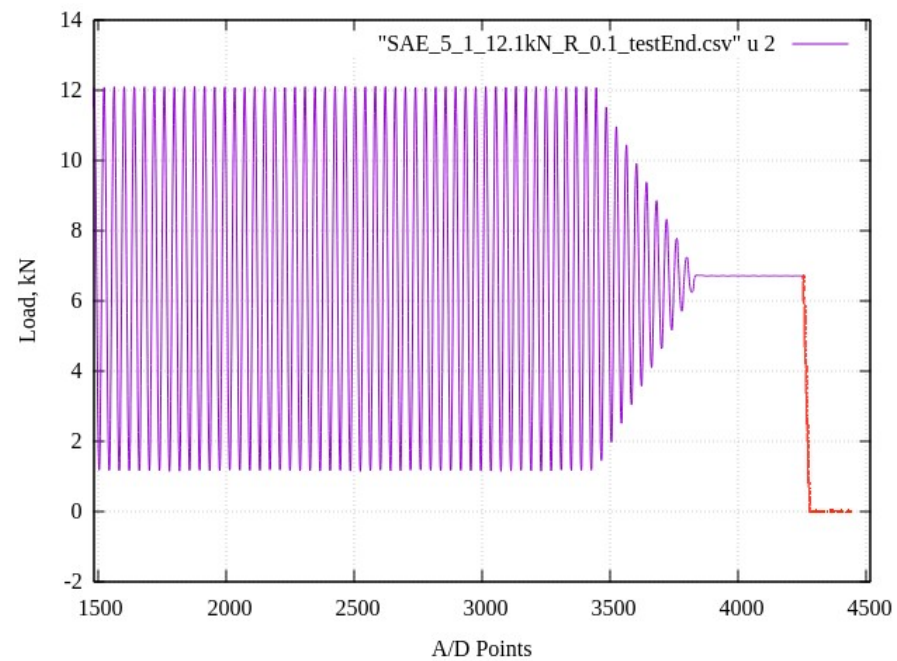


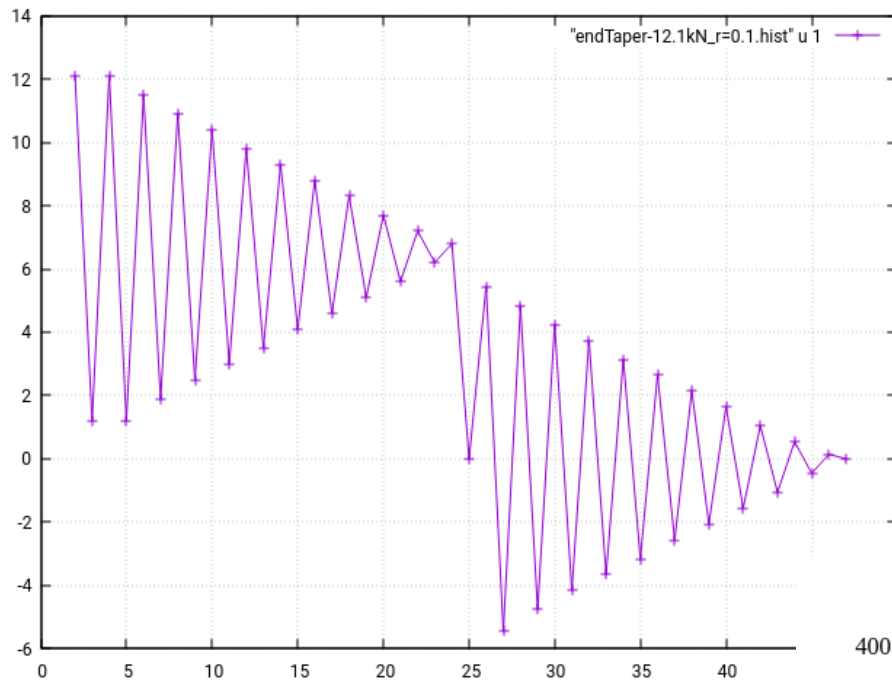


We decided to check what happens at a lower level.

Test  $P_{max} = 12.1$   $R = 0.1$

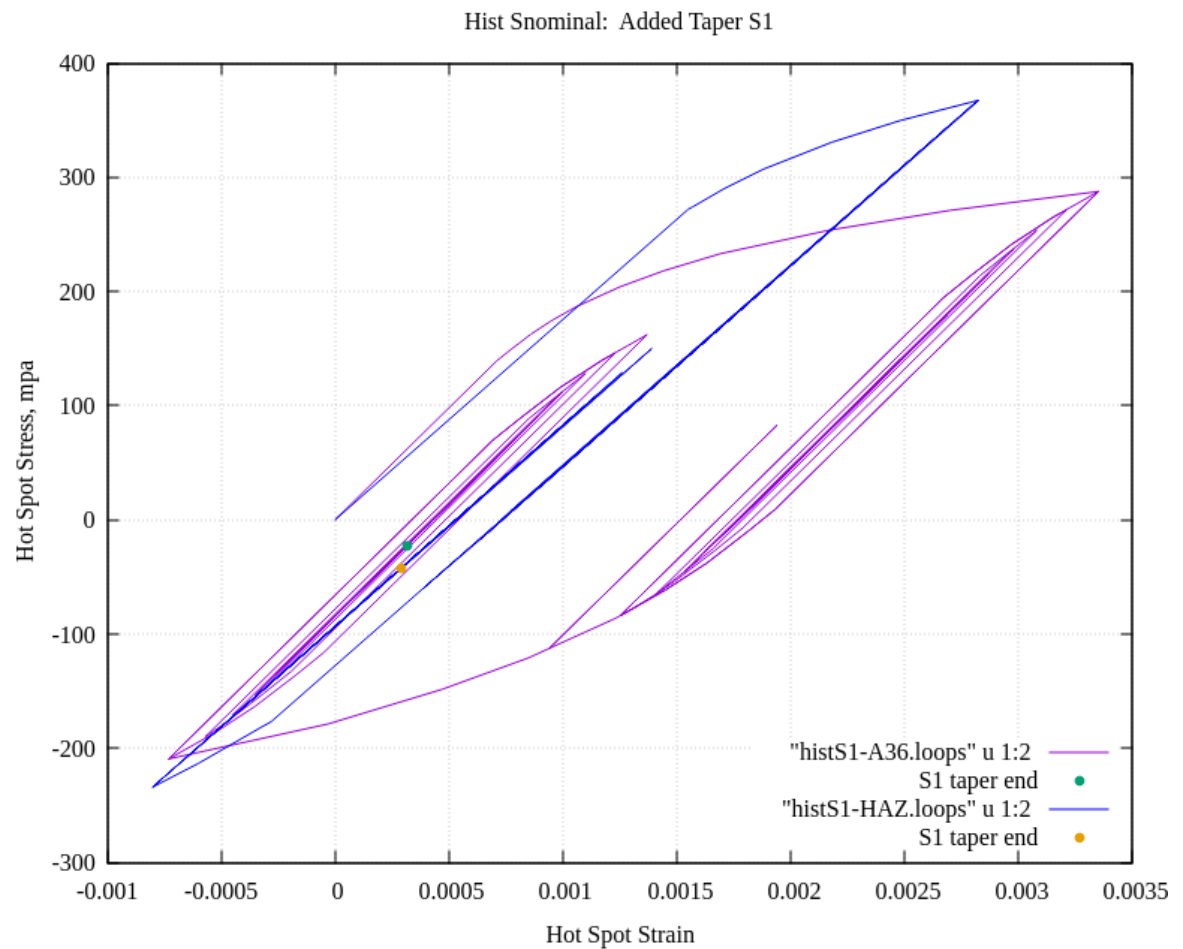






Simulated: What happens locally if we add another taper ?

Too messy. Keep it simple.



Conclusion:

Lets try something at lower load level and  
 $R = -1$