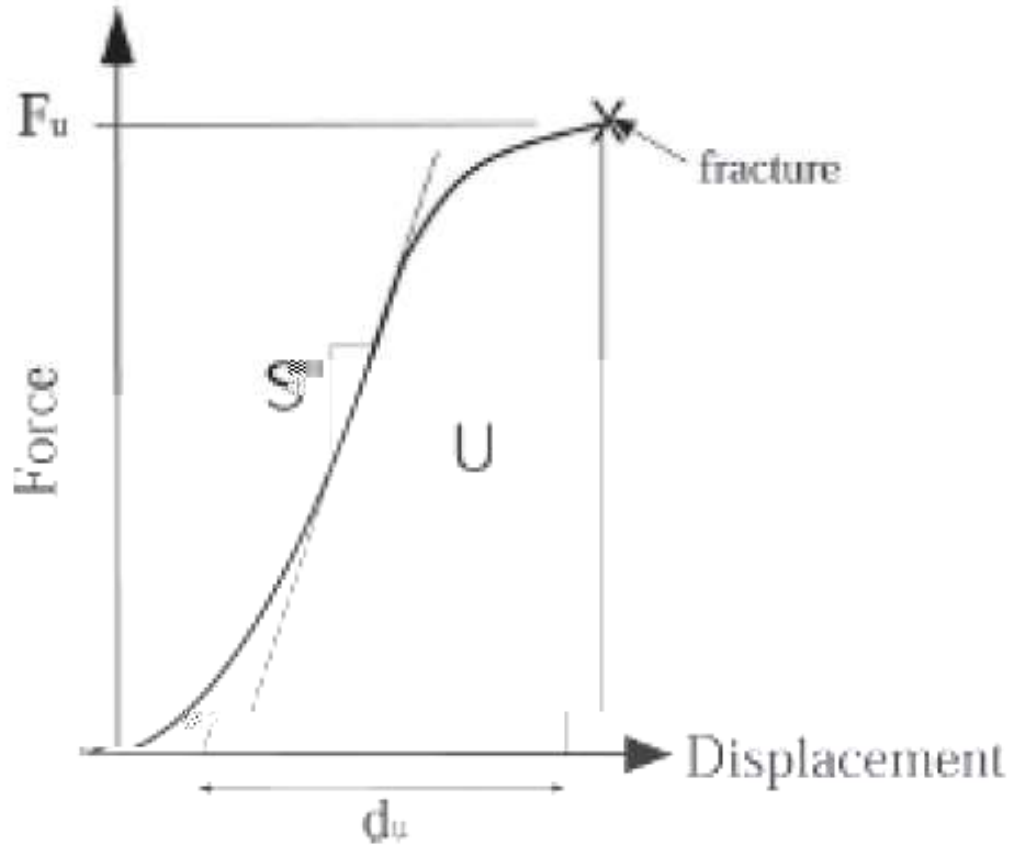
Finite Element Analysis of Radius and Ulna

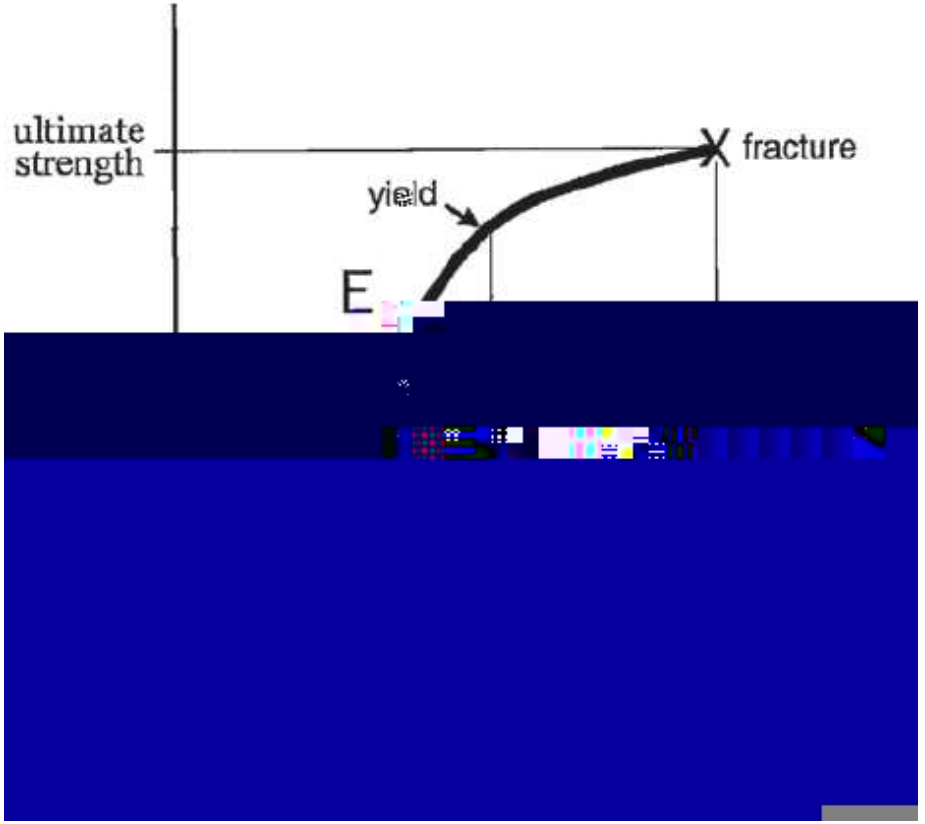
Outline

Why Bones Break

F_u



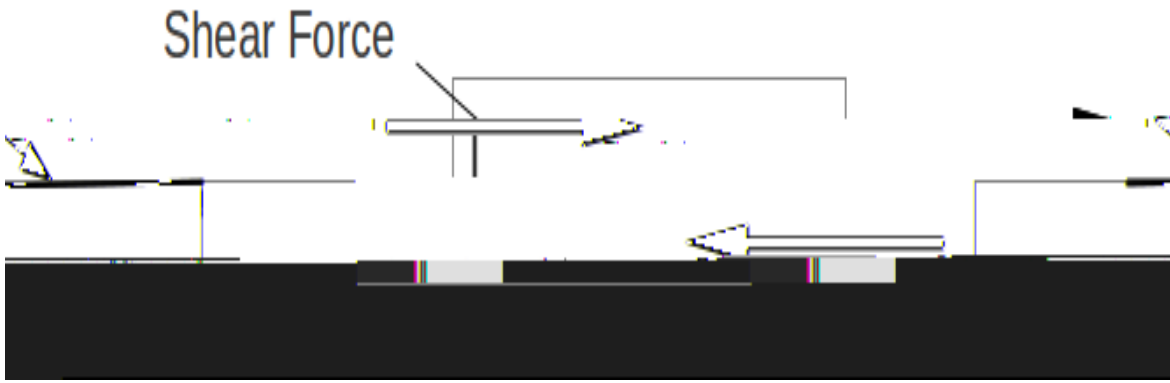
Why Bones Break



Analysis Concepts

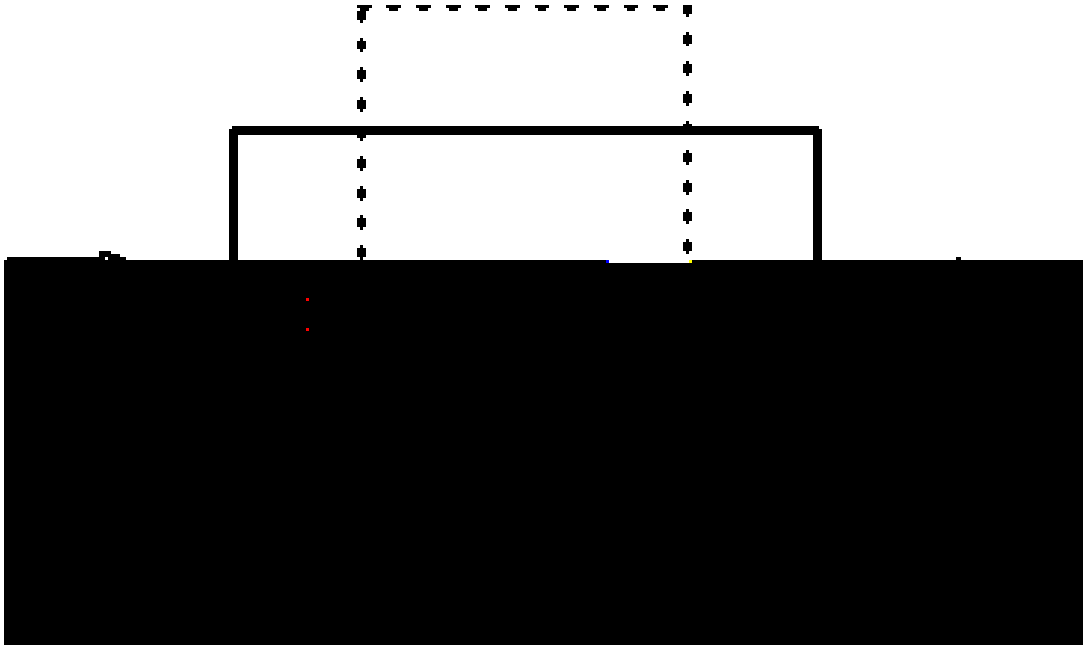
Analysis Concepts

$$S = \frac{F_p / A}{\varepsilon_s}$$



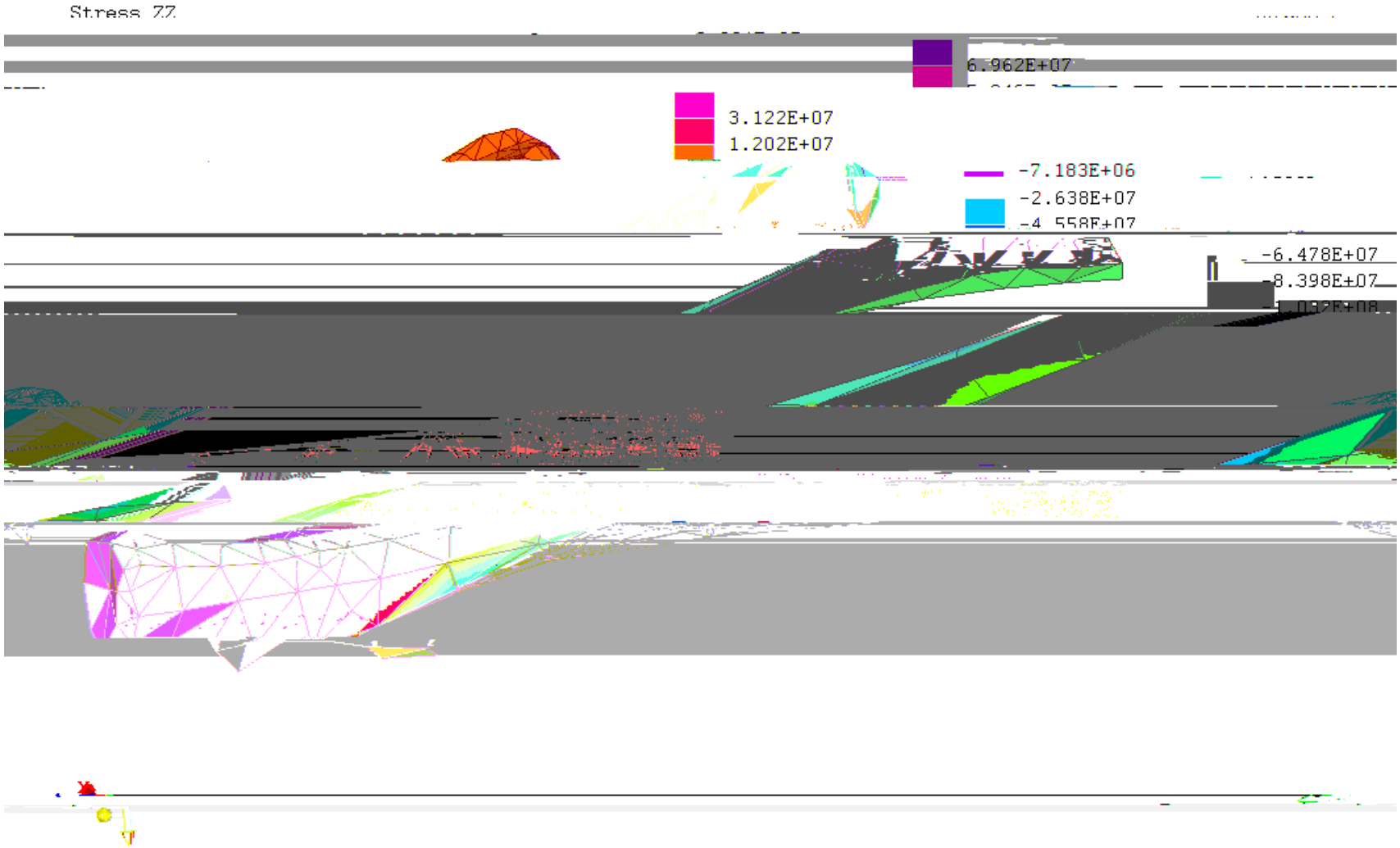
Analysis Concepts

$$\upsilon = -\frac{\varepsilon_t}{\varepsilon_l}$$



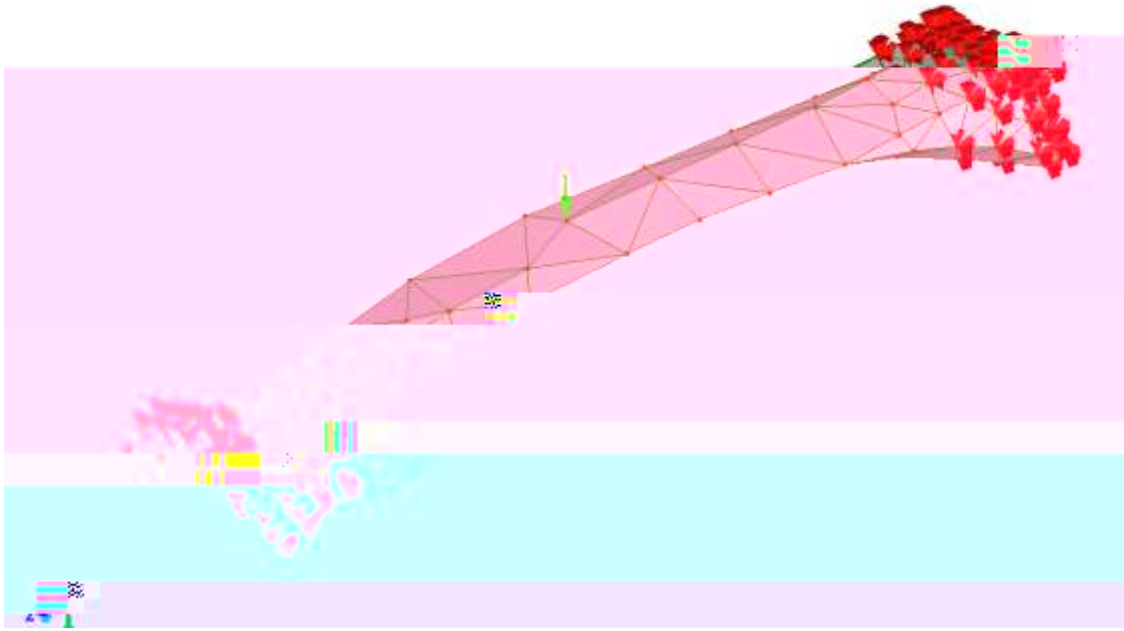
Analysis Concepts

Radius Catching Fall

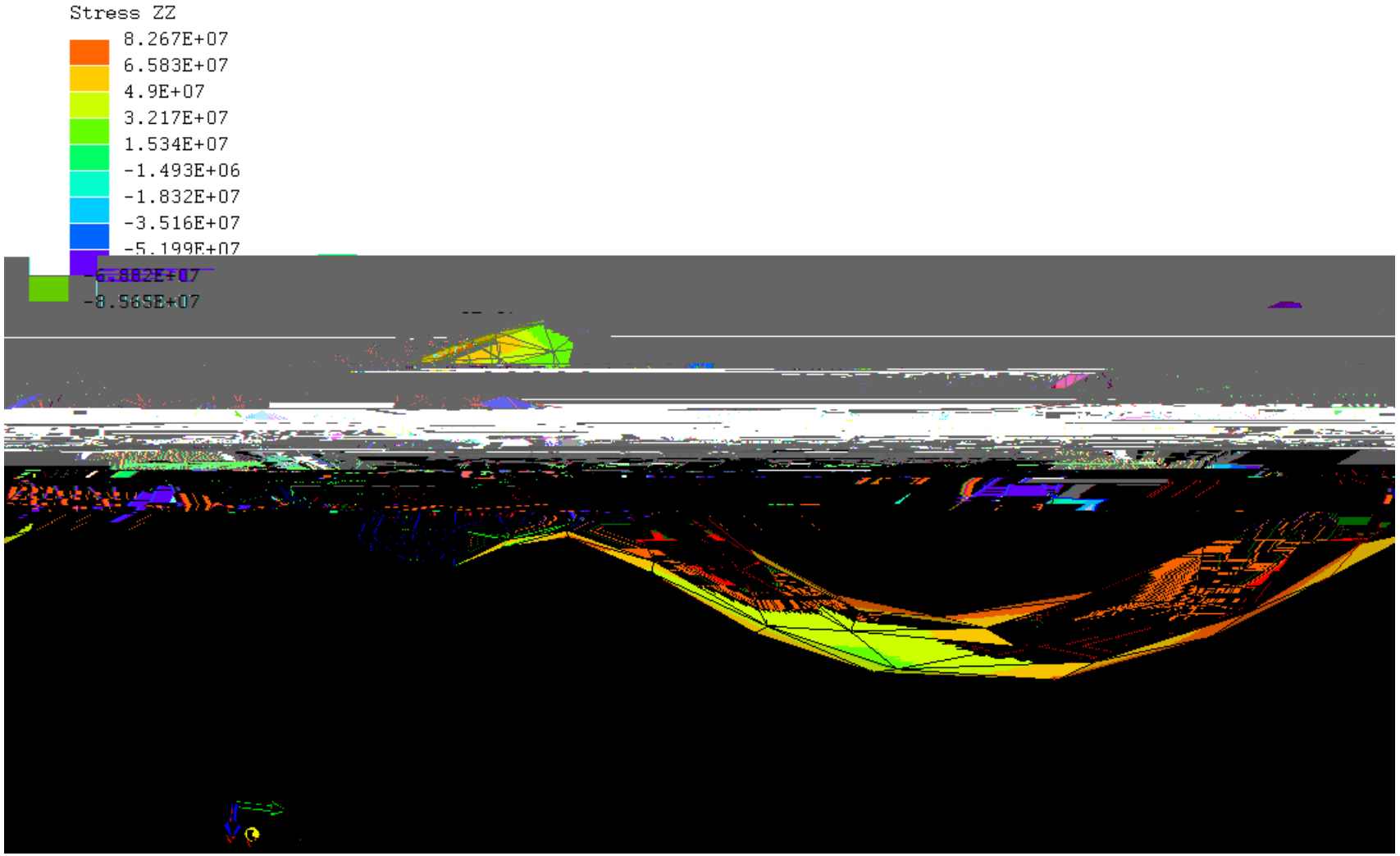


Radius Catching Fall

Radius Middle Load



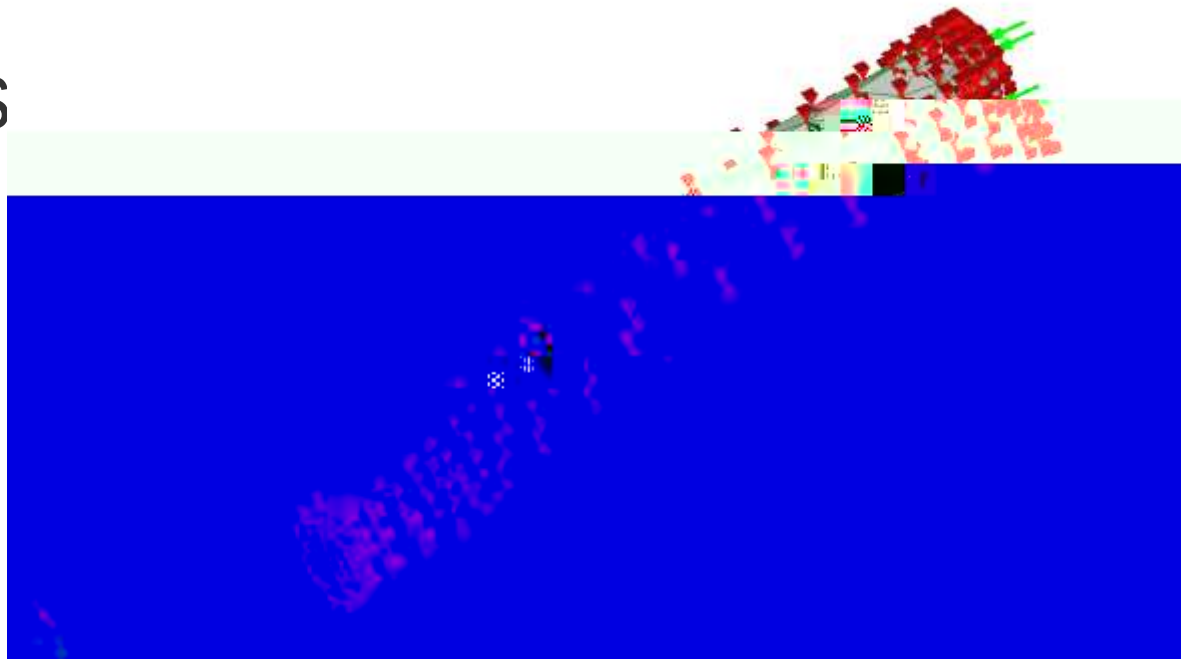
Radius Middle Load



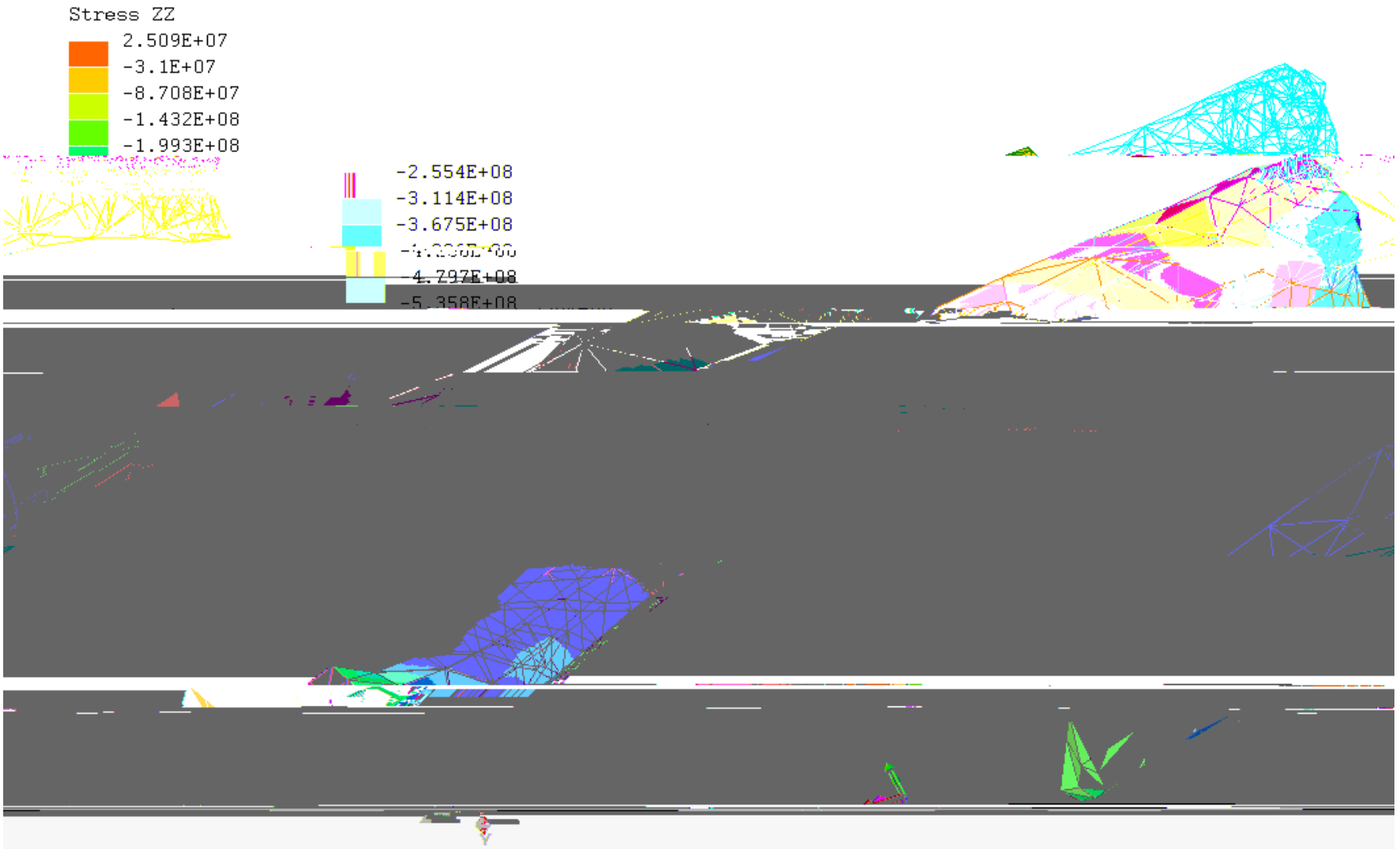
Radius Middle Load

Ulna Middle Load

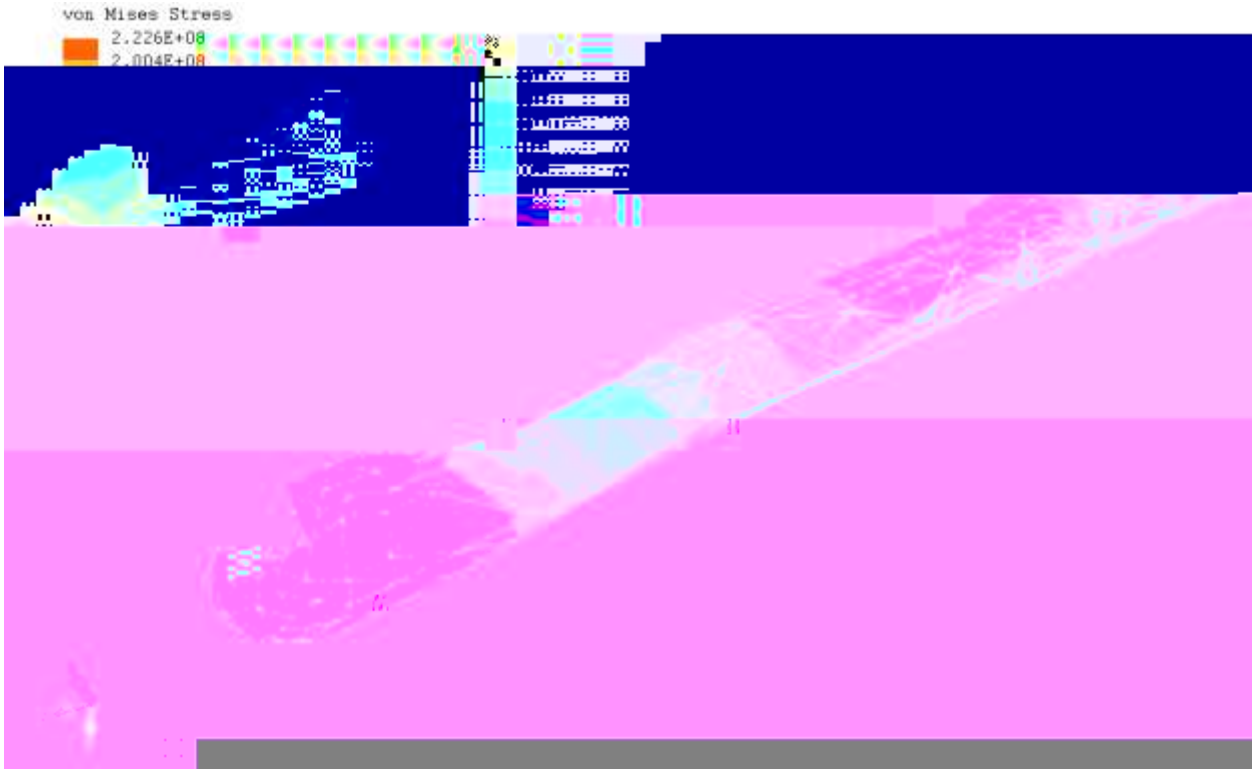
Radius Compress Ends



Radius Compress Ends

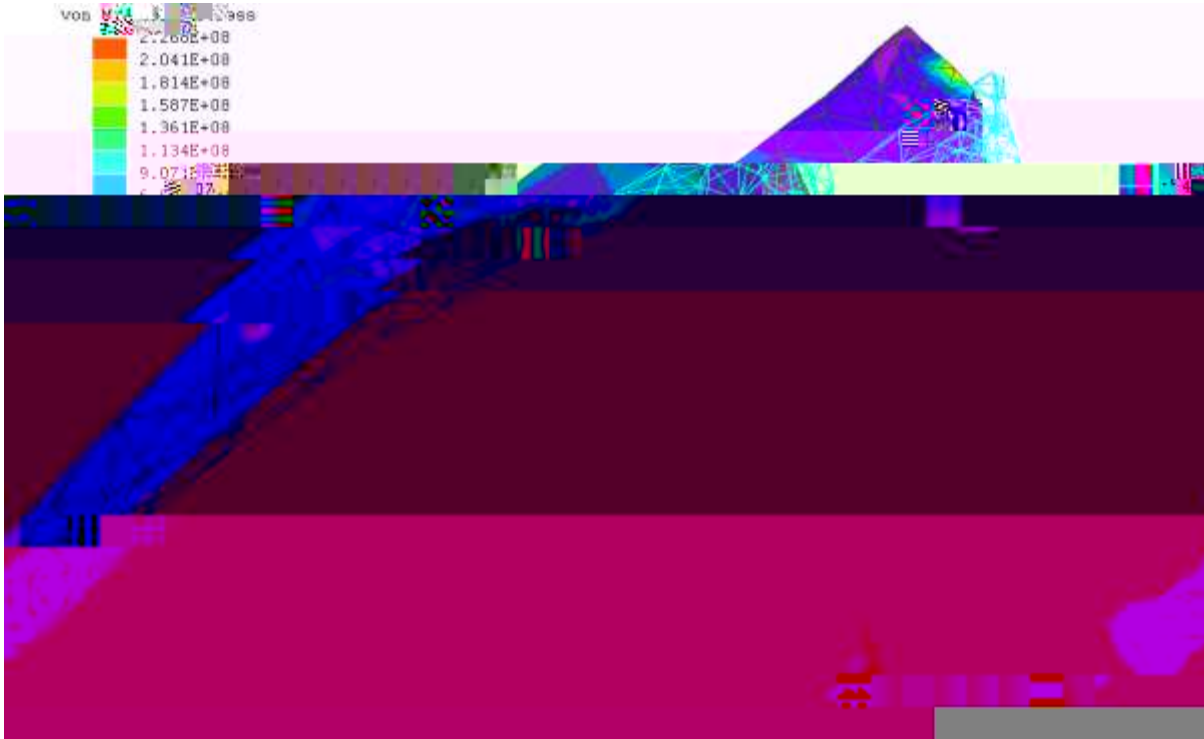


Ulna Compress Ends

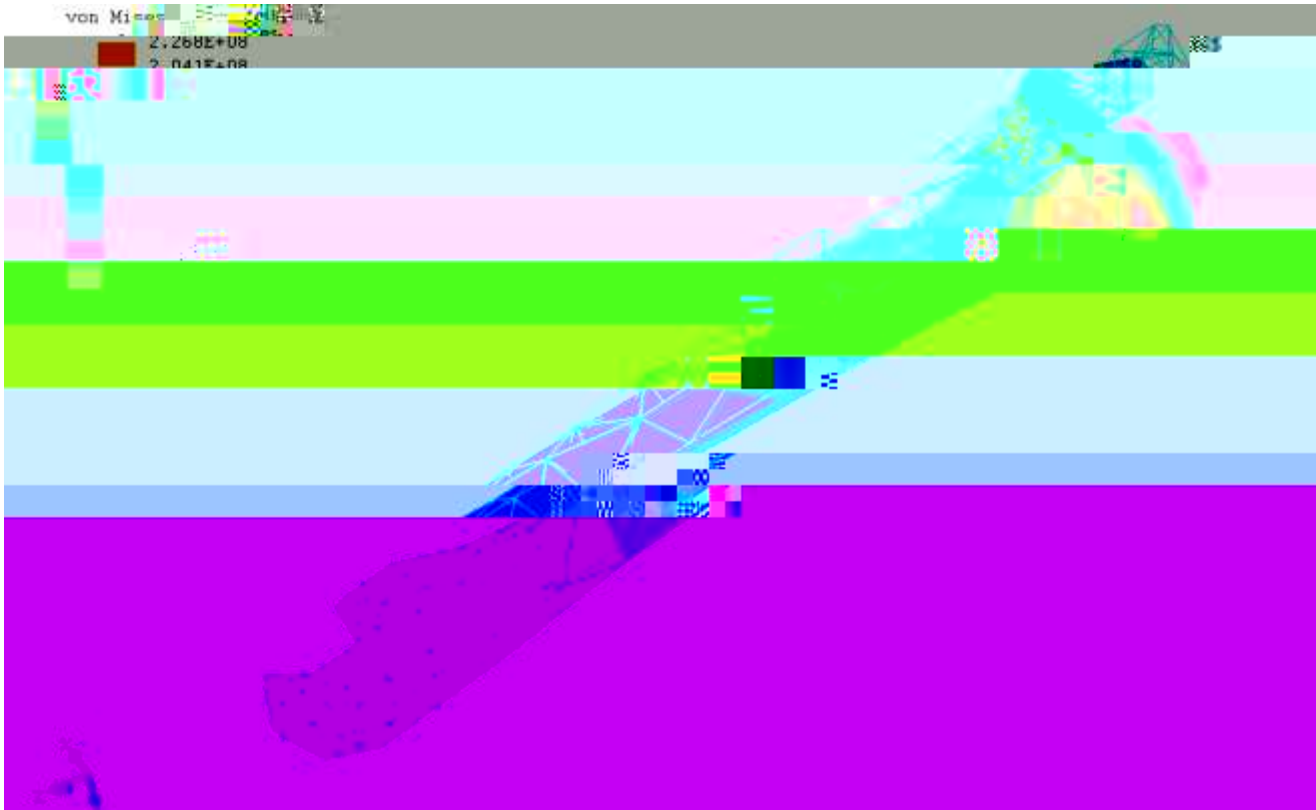


Radius Twist

Radius Twist



Ulna Twist



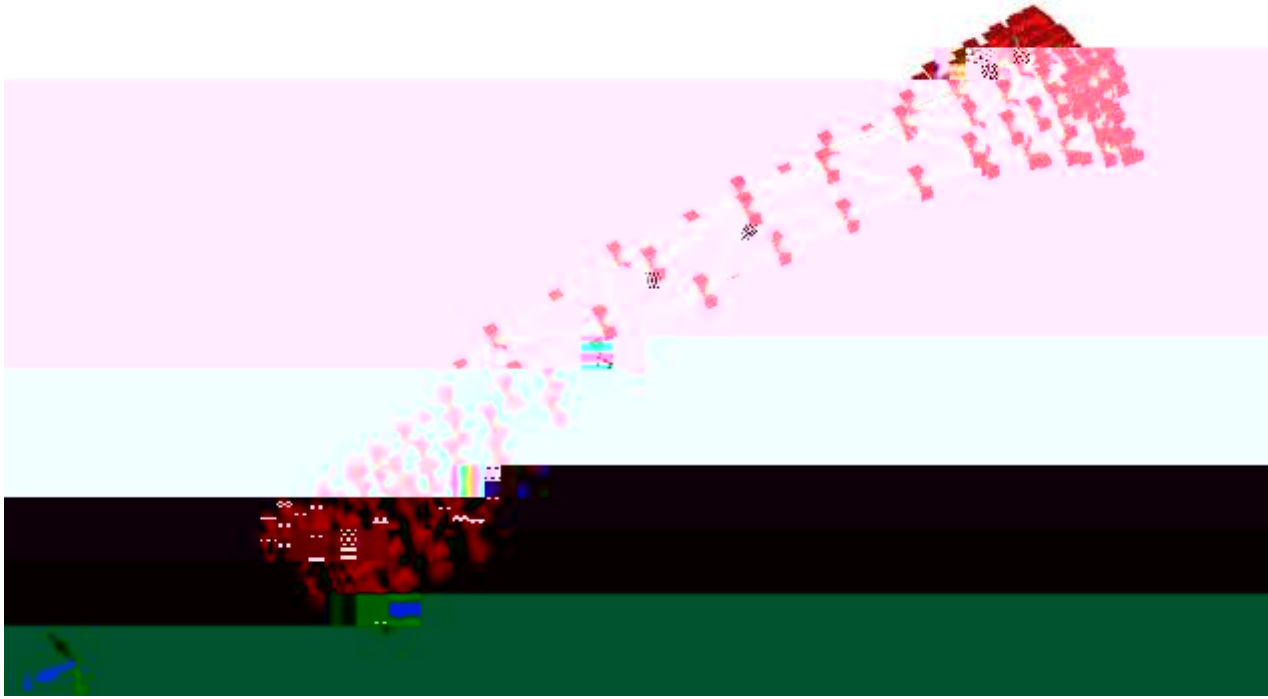
Summary of Forces

	Radius	Ulna
Catching Fall	1,160 N	1,610 N
Mid	4,720 N	7,450 N
Comp	34,200 N	40,200 N
Stretch	23,895 N	28,100 N
Twist	54.66 N·m	78.59 N·m

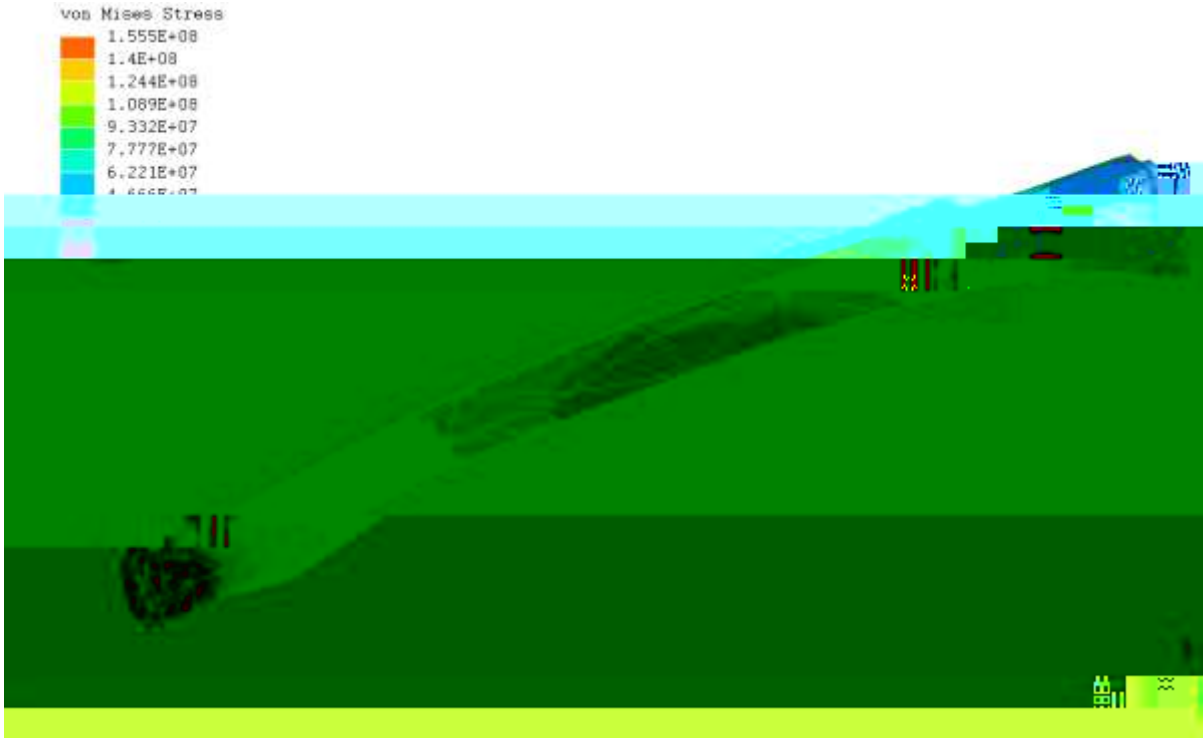
Thank You

Questions?

Radius
Stretch Ends

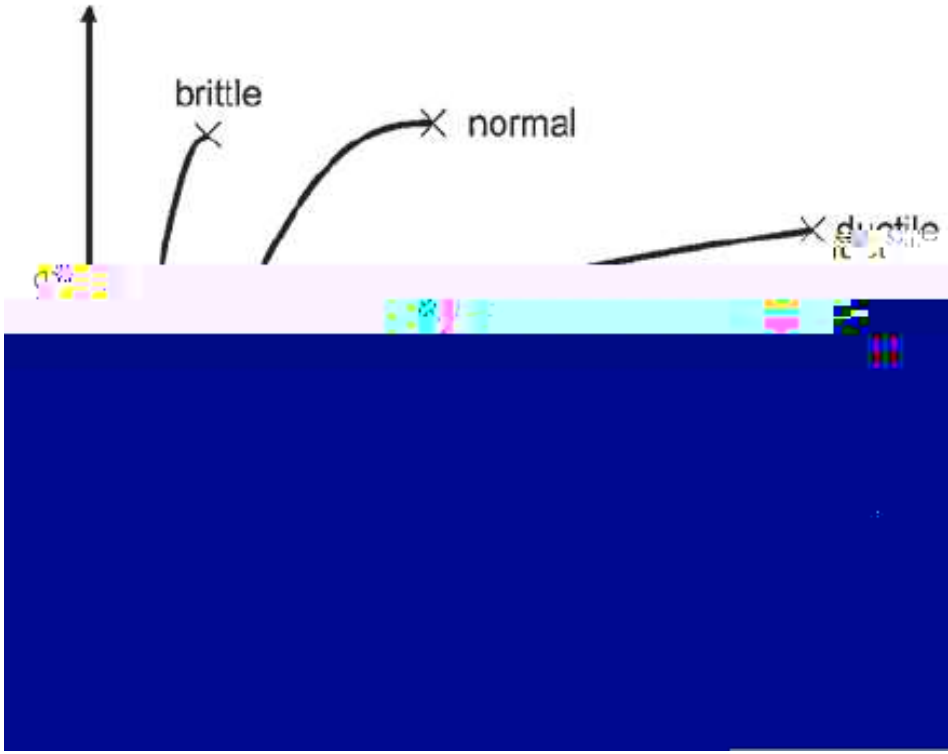


Radius Stretch Ends

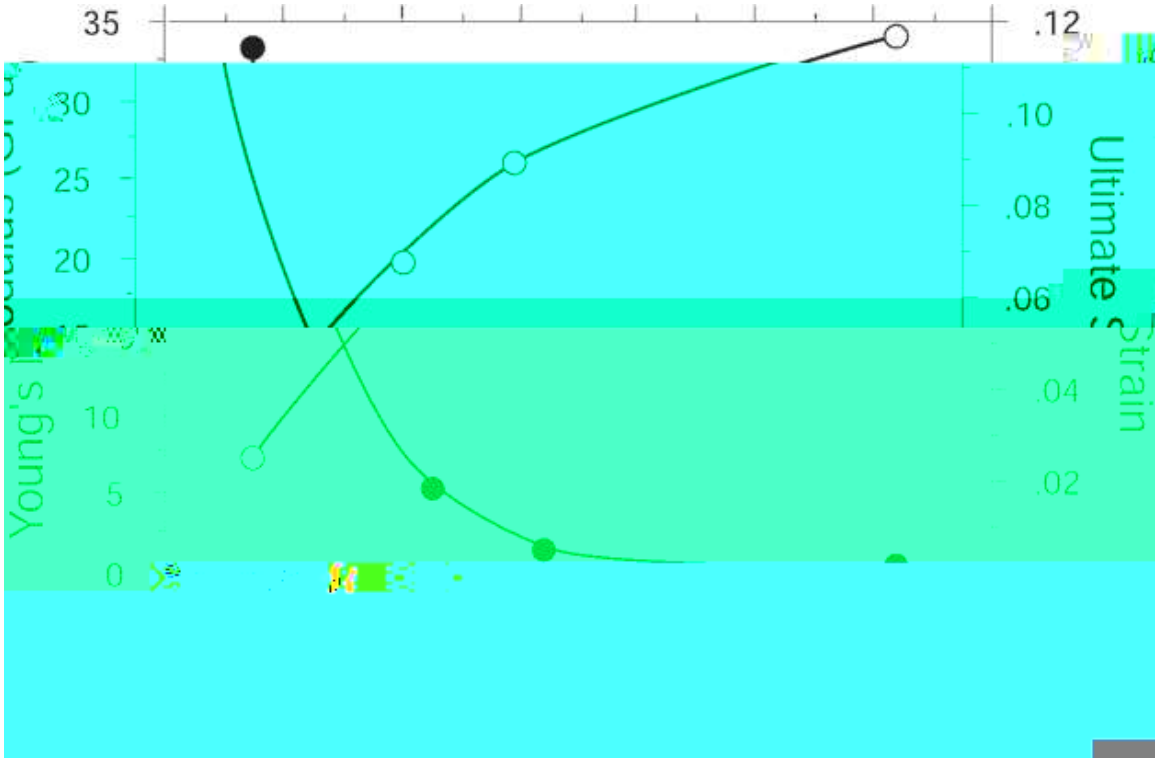


Analysis Basics

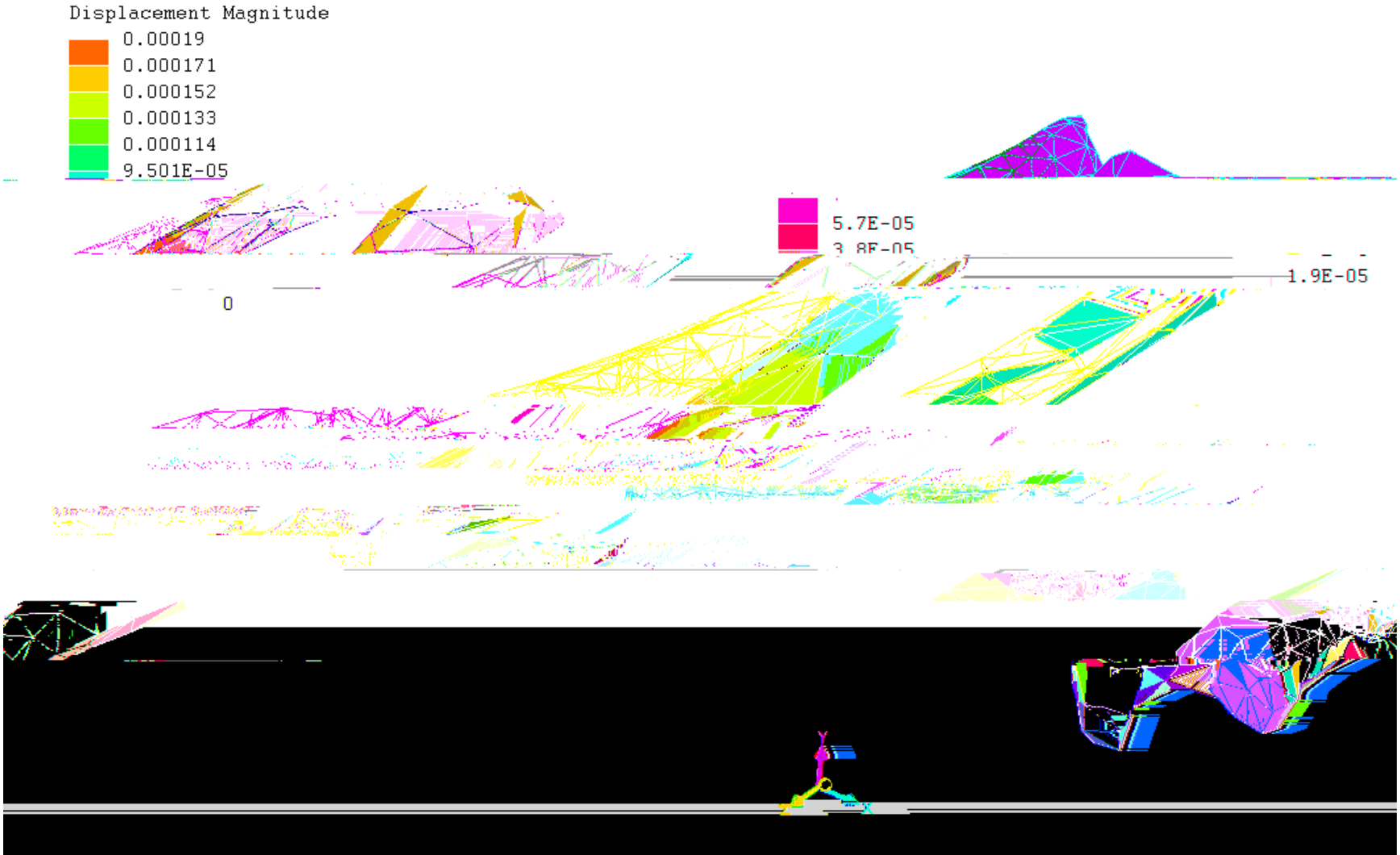
Why Bones Break



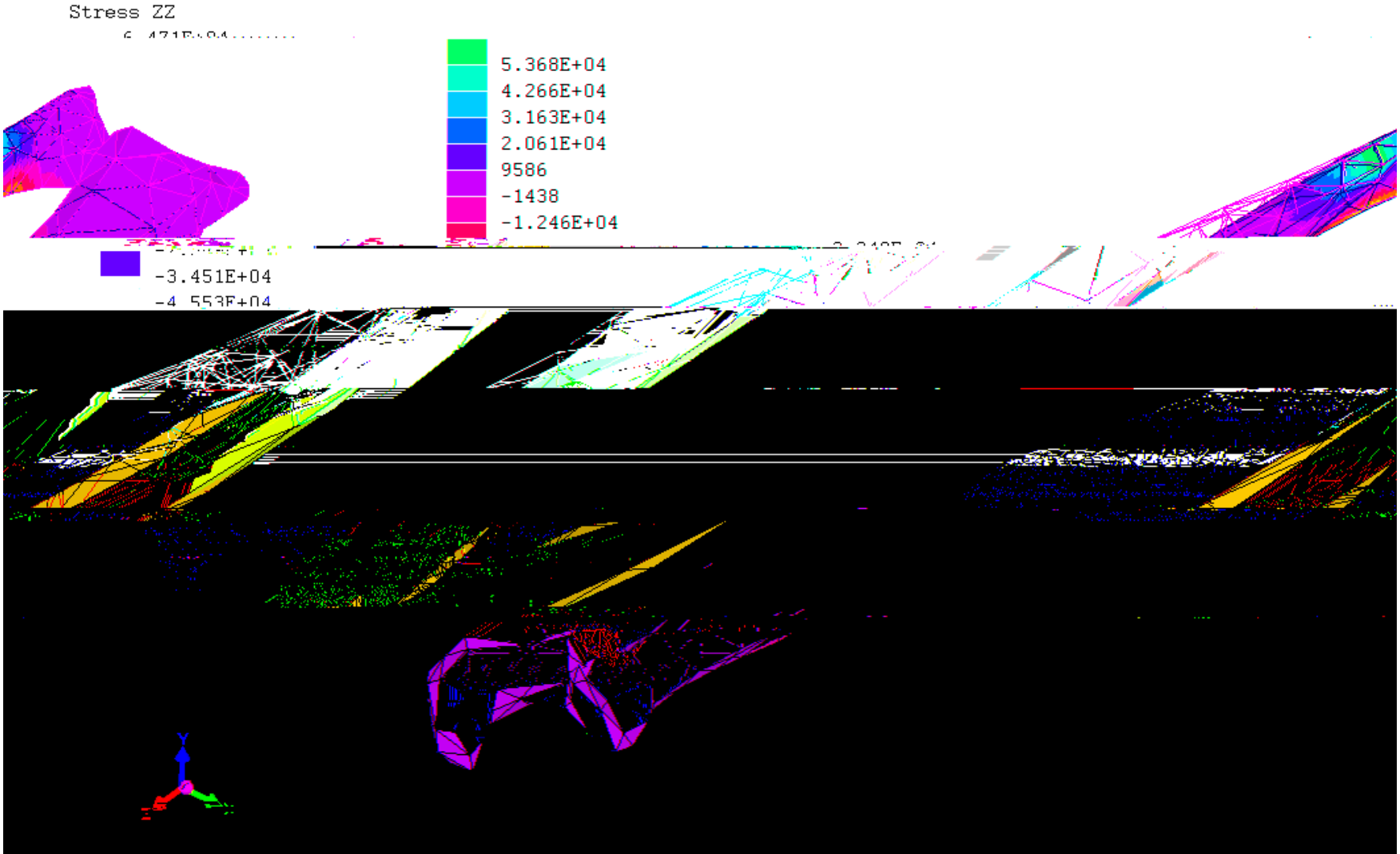
Why Bones Break



Current Model



Current Model



Future Work

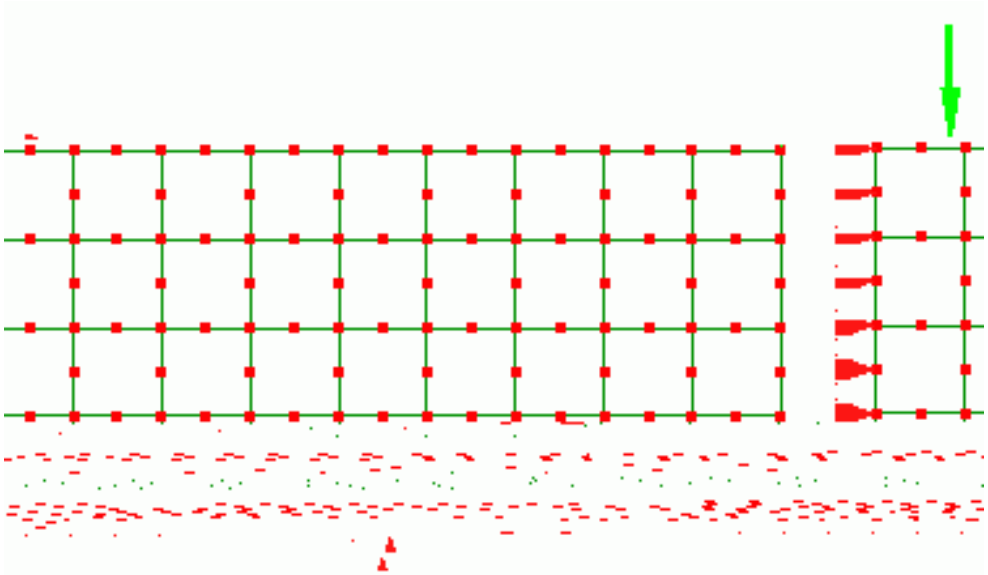
Future Work

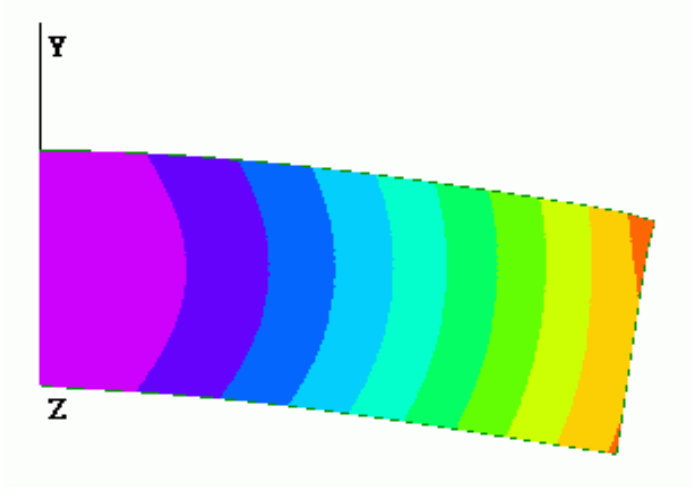
Conclusion

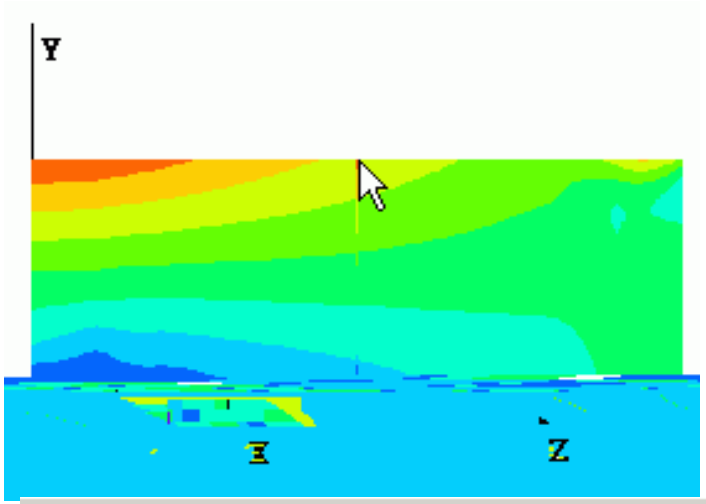
Works Cited

FEA Review

FEA Review







Node 54 X 5 Y 4 Z 0 stressxx 46.872266646973

Node 10 X 5 Y 0 Z 0 stressxx -46.8726816675875