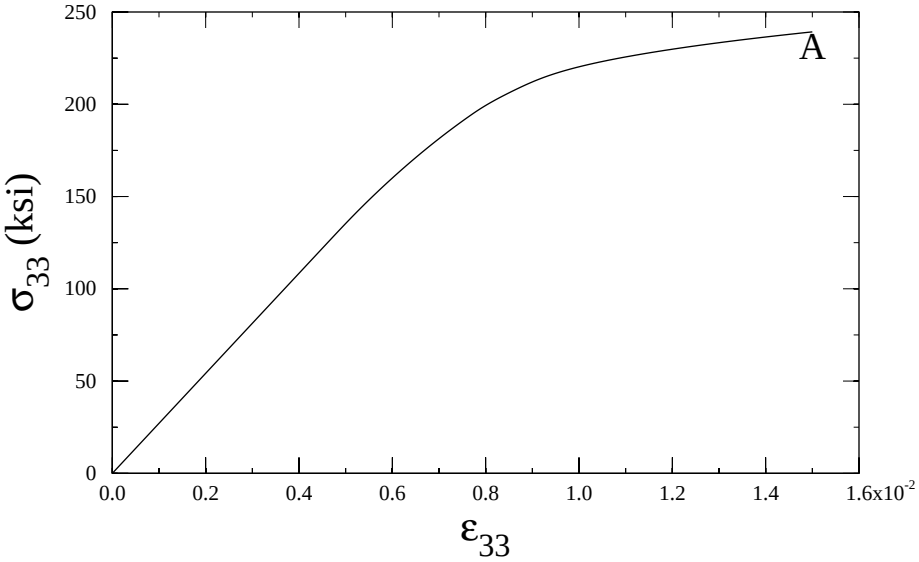
## 6.19 Example S: PATRAN/MSC MACPOST Output

Sample Input File for PATRAN/MSC MACPOST Output

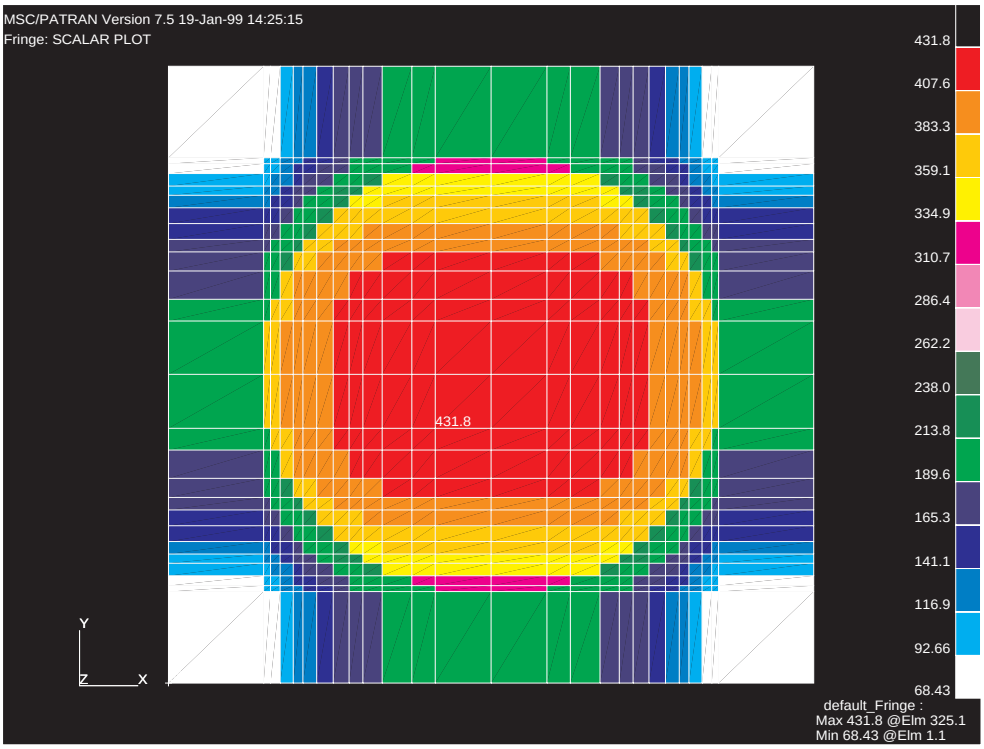
Problem Summary

| | |
|---|---|
| Load Type: | Thermomechanical |
| Load Direction: | 33 |
| Load History: | Monotonic |
| Load Control: | Strain |
| Load History Data: | Cool from 900$^{o}$C to 23$^{o}$C, then hold temperature during mechanical loading<br>$\dot{T}$ =0.0152 $^{o}$C/sec<br>$\dot{\varepsilon}$ =1.667x10$^{-4}$ /sec, $\varepsilon_{max}$=0.015, $\varepsilon_{min}$=0.<br>$\Delta t_{thermal}$= 100 sec.; $\Delta t_{mech}$ =0.1 sec. |
| Micromechanics Model: | Double Periodicity |
| Fiber Packing Arrangement: | Square Pack, 40% fiber volume ratio |
| Repeating Unit Cell: | 26x26 circular fiber cross-section approximation |
| Integration Algorithm: | Forward Euler |
| Constituent Material Model: | Fiber: Elastic<br>Matrix: GVIPS – isotropic form |
| Constituents: | Fiber: SCS-6<br>Matrix: TIMETAL21S |
| PATRAN Output: | Start output after cooldown: *tpre* = 57600 sec.<br>Write to output files every 300 time steps |

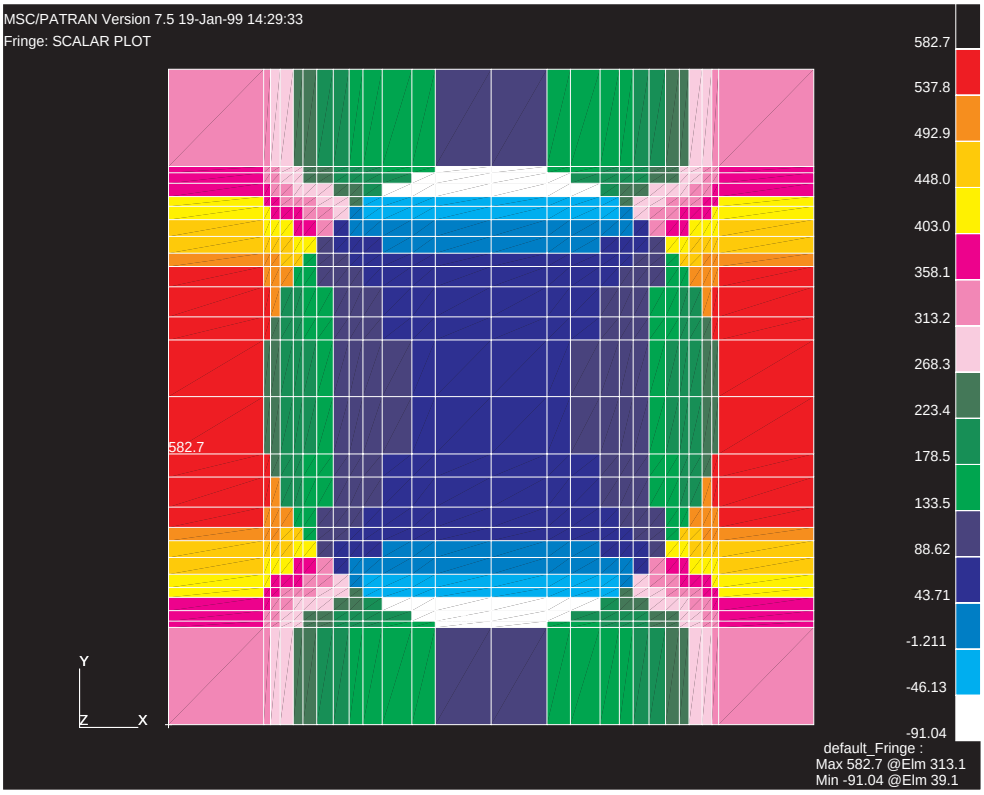
```
test of PATRAN output
*PRINT
  NPL=1 %
*LOAD
  LCON=3 LOP=3 LSS=1 %
*MECH
  NPTW=3 TI=0.,57600.,57690. LO=0.,0.,0.015 %
*THERM
  NPTT=3 TI=0.,57600.,57690. TE=900.,23.,23. %
*MODEL
  MOD=1 %
*PATRAN
  FN=apdxs TPRE=57600 STP=300  %
*SOLVER
  NTF=1 NPTS=3 TIM=0.,57600.,57690. STP=100,0.1 %
*FIBER
  NFIBS=1
  NF=1 MF=6 NDPT=2 MAT=E %
*MATRIX
  NMATX=1
  NM=1 MM=4 NDPT=2 MAT=A %
*MRVE
  IDP=13 VF=0.4 R=1
*CURVE
  NP=2 %
*MACRO
  NT=1
  NC=1 X=3 Y=9 NAM=apdxs
*END
```




Macro stress-strain behavior results




Contour of the microlevel $J_2$ invariant at 1.5% macrostrain (@ pt. A)




Contour of the microlevel $I_1$ invariant at 1.5% macrostrain (@ pt. A)