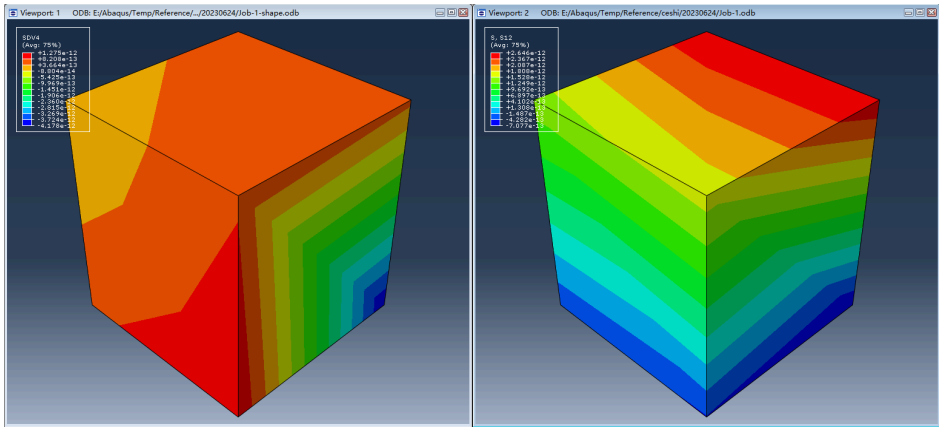
C3D8单元结果不同? Why are the results of the C3D8 element different?

浏览: 1875 回答: 3 Views: 1875 Answers: 3

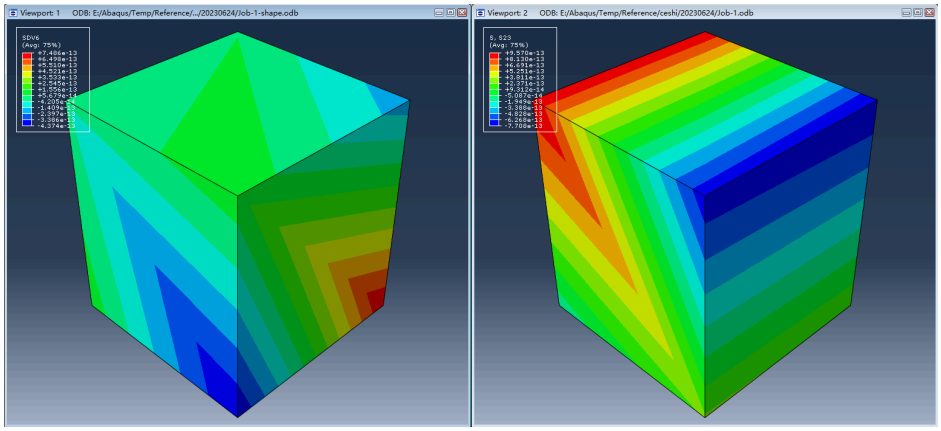
用UEL编写的C3D8 单元进行程序验证时，结果不同是什么原因造成?

Why do the results differ when verifying the program with a C3D8 element written in UEL?

S12方向的应力 Stress in the S12 direction



S23方向的应力 Stress in the S23 direction



.inp文件 .inp file

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1个回答
干啥用的?
What is the compression edge??? 1 answer What is it used for?

TimeHist Postpro 中minimum 和 maxmum...
1个回答
是什么原因?

Why is the minimum and maximum displayed as invalid in the TimeHist Postpro? 1 reply, what is the reason?

如何设置才可让ADAMS信息窗口的字体显...
暂无回答
如何设置才可让ADAMS信息窗口的字体显示更大?

How to set the font size to be larger in the ADAMS information window? Currently no answer, how to set it?

```
** PARTS
**
*Part, name=Part-1
*Node
      1,          1.,          1.,          1.
      2,          1.,          0.,          1.
      3,          1.,          1.,          0.
      4,          1.,          0.,          0.
      5,          0.,          1.,          1.
      6,          0.,          0.,          1.
      7,          0.,          1.,          0.
      8,          0.,          0.,          0.
**********************************************
*User element, nodes=8, type=U1, properties=2, coordinates=3, VARIABLES=96
1, 2, 3
*Element, type=U1, Elset=solid
1, 5, 6, 8, 7, 1, 2, 4, 3
**********************************************************************
*Uel property, elset=solid
200e3, 0.3
*Element, type=C3D8, elset=Visualization
11,5, 6, 8, 7, 1, 2, 4, 3
*Nset, nset=Set-1, generate
 1,  8,  1
*Elset, elset=Set-1
 1,
** Section: Section-1
*Solid Section, elset=Visualization, material=Material-1
,
*End Part
**
```

UEL.for文件 UEL.for file

```
 do kintk=1,ninpt

  call kshapefcn(kintk,ninpt,nnode,ndim,dN,dNdz)
  call kjacobian(jelem,ndim,nnode,coords,dNdz,djac,dNdx,mcrd)
  dvol=wght(kintk)*djac


  b=0.d0
  do inod=1,nnode
     b(1,3*inod-2) = dNdx(1,inod)
     b(2,3*inod-1) = dNdx(2,inod)
     b(3,3*inod)   = dNdx(3,inod)
     b(4,3*inod-2) = dNdx(2,inod)
     b(4,3*inod-1) = dNdx(1,inod)
     b(5,3*inod-1) = dNdx(3,inod)
     b(5,3*inod)   = dNdx(2,inod)
     b(6,3*inod-2) = dNdx(3,inod)
     b(6,3*inod)   = dNdx(1,inod)

  end do

  dstran=matmul(b,du(1:ndim*nnode,1))

  call kstatevar(kintk,nsvint,svars,statevLocal,1)

  stress=statevLocal(1:ntens)
  stran(1:ntens)=statevLocal((ntens+1):(2*ntens))


**************************************************************


  call kumat(props,ddsdde,stress,dstran,ntens,statevLocal)

  stran=stran+dstran


  statevLocal(1:ntens)=stress(1:ntens)
  statevLocal((ntens+1):(2*ntens))=stran(1:ntens)


  call kstatevar(kintk,nsvint,svars,statevLocal,0)

  amatrx(1:24,1:24)=amatrx(1:24,1:24)+
1 dvol*(matmul(matmul(transpose(b),ddsdde),b))

  rhs(1:24,1)=rhs(1:24,1)-
1 dvol*(matmul(transpose(b),stress))


put
```

形函数： Shape function:

```
subroutine kshapefcn(kintk,ninpt,nnode,ndim,dN,dNdz)

include 'aba_param.inc'

parameter (gaussCoord=(1.d0/3.d0)**0.5d0)
dimension dN(nnode,1),dNdz(ndim,*),coord38(3,8)

data  coord38 /-1.d0, -1.d0, -1.d0,
2               1.d0, -1.d0, -1.d0,
3               1.d0,  1.d0, -1.d0,
4              -1.d0,  1.d0, -1.d0,
5              -1.d0, -1.d0,  1.d0,
6               1.d0, -1.d0,  1.d0,
7               1.d0,  1.d0,  1.d0,
8              -1.d0,  1.d0,  1.d0/

3D 8-nodes

determine (g,h,r)
g=coord38(1,kintk)*gaussCoord
h=coord38(2,kintk)*gaussCoord
r=coord38(3,kintk)*gaussCoord

shape functions
dN(1,1)=(1.d0-g)*(1.d0-h)*(1.d0-r)/8.d0
dN(2,1)=(1.d0+g)*(1.d0-h)*(1.d0-r)/8.d0
dN(3,1)=(1.d0+g)*(1.d0+h)*(1.d0-r)/8.d0
dN(4,1)=(1.d0-g)*(1.d0+h)*(1.d0-r)/8.d0
dN(5,1)=(1.d0-g)*(1.d0-h)*(1.d0+r)/8.d0
dN(6,1)=(1.d0+g)*(1.d0-h)*(1.d0+r)/8.d0
dN(7,1)=(1.d0+g)*(1.d0+h)*(1.d0+r)/8.d0
dN(8,1)=(1.d0-g)*(1.d0+h)*(1.d0+r)/8.d0

derivative d(Ni)/d(g)
dNdz(1,1)=-(1.d0-h)*(1.d0-r)/8.d0
dNdz(1,2)= (1.d0-h)*(1.d0-r)/8.d0
dNdz(1,3)= (1.d0+h)*(1.d0-r)/8.d0
dNdz(1,4)=-(1.d0+h)*(1.d0-r)/8.d0
dNdz(1,5)=-(1.d0-h)*(1.d0+r)/8.d0
dNdz(1,6)= (1.d0-h)*(1.d0+r)/8.d0
dNdz(1,7)= (1.d0+h)*(1.d0+r)/8.d0
dNdz(1,8)=-(1.d0+h)*(1.d0+r)/8.d0


derivative d(Ni)/d(h)
dNdz(2,1)=-(1.d0-g)*(1.d0-r)/8.d0
dNdz(2,2)=-(1.d0+g)*(1.d0-r)/8.d0
dNdz(2,3)= (1.d0+g)*(1.d0-r)/8.d0
dNdz(2,4)= (1.d0-g)*(1.d0-r)/8.d0
dNdz(2,5)=-(1.d0-g)*(1.d0+r)/8.d0
dNdz(2,6)=-(1.d0+g)*(1.d0+r)/8.d0
dNdz(2,7)= (1.d0+g)*(1.d0+r)/8.d0
dNdz(2,8)= (1.d0-g)*(1.d0+r)/8.d0

derivative d(Ni)/d(r)
dNdz(3,1)=-(1.d0-g)*(1.d0-h)/8.d0
dNdz(3,2)=-(1.d0+g)*(1.d0-h)/8.d0
dNdz(3,3)=-(1.d0+g)*(1.d0+h)/8.d0
```

```
      dNdz(3,4)=-(1.d0-g)*(1.d0+h)/8.d0
      dNdz(3,5)= (1.d0-g)*(1.d0-h)/8.d0
      dNdz(3,6)= (1.d0+g)*(1.d0-h)/8.d0
      dNdz(3,7)= (1.d0+g)*(1.d0+h)/8.d0
      dNdz(3,8)= (1.d0-g)*(1.d0+h)/8.d0

      return
      end
C**********************************************************
```

出现误差的原因是否是由于形函数的编号和Abaqus中不同造成呢?

Is the cause of the error due to the difference in the numbering of the shape functions and Abaqus?

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ABAQUS C3D8采用的是选择缩减积分，并不完全是全积分。

ABAQUS C3D8 uses selective reduced integration, not fully integrated.

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