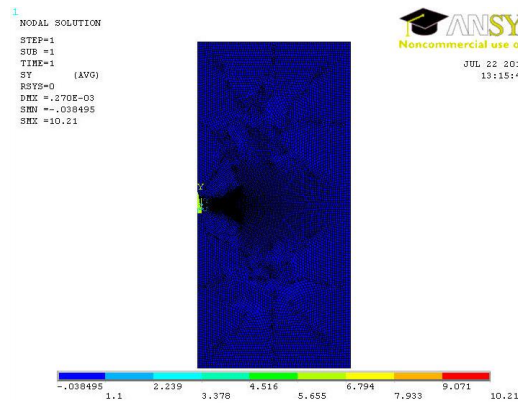
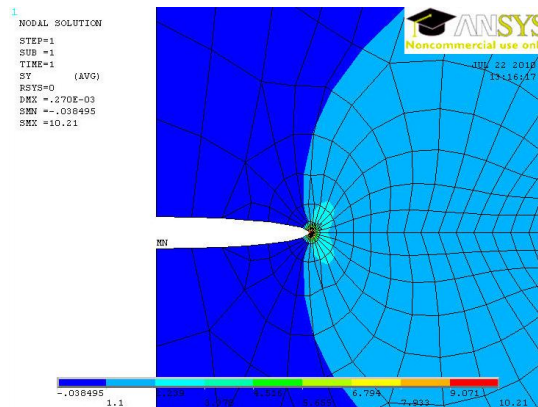


# The macro of mode-I central crack for KSCON™ model

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!!! This macro is used to solve mode-I central crack problems in a

!!! semi-infinite strip under uniform tension loadings.

!!! The parameters/variables taken by the macro are

!!! P : Uniform tension loading

!!! CR\_L : Crack length

!!! WW : Plate width

!!! HH: 1/2 height of plate

!!! NEL\_THET : Elements numbers at  $\theta$  angle direction

!!! CRFACE\_LESIZE : Elements distribution ratio in the crack surface

!!! R\_SIZE\_RATIO : Distance ratio between elements at radial direction of crack  
! zone

!!! R\_F : Size of first circular element in the crack zone

!!! R\_F1 : Size of three circular elements in the crack zone

P=1

CR\_L=1

WW=40

HH=40

R\_SIZE\_RATIO=2

CRFACE\_LESIZE=0.2

R\_F=0.05

NEL\_THET=12

R\_F1=R\_F\*3

TO\_1= CR\_L/10E6

TO=CR\_L- TO\_1

/PREP7

ET,1,PLANE82

MP,EX,1,30E4

MP,NUXY,1,0.3

K,1,

K,2,,HH

K,3,WW,HH

K,4,WW

K,5,CR\_L

L,1,2

L,2,3

L,3,4

L,4,5

L,5,1

AL,1,2,3,4,5

APLOT

ASEL,NONE

LSEL,NONE

KSEL,NONE

K,6,

K,7,,-HH

K,8,WW,-HH  
K,9,WW  
K,10,CR\_L  
L,6,7  
L,7,8  
L,8,9  
L,9,10  
L,10,6  
AL,6,7,8,9,10  
APLOT  
ALLSEL  
KSEL,,LOC,Y,- TO\_1, TO\_1  
KSEL,U,LOC,X,- TO\_1, TO  
NUMMRG,KP  
ALLSEL,,KP  
APLOT  
ESIZE,0.6  
LESIZE,5, CRFACE\_LESIZE  
LESIZE,10, CRFACE\_LESIZE  
KSCON,5, R\_F,1, NEL\_THET, R\_SIZE\_RATIO  
AMESH,1  
AMESH,2  
DL,1,1,UX,0  
DL,6,2,UX,0  
DK,7,UX,0  
DK,7,UY,0  
SFL,2,PRES,-P

```
SFL,7,PRES,-P

SAVE

/SOLU

SOLVE

/POST1

PLNSOL,S,Y

/EDGE,1,1

REPLOT

CLOCAL,11,1,CR_L,0,0

NSEL,,LOC,X,- CR_L/10E6, CR_L/10E6

*GET,NN1,NODE,0,NUM,MAX

NSEL,,LOC,Y,180+0.01,180-180/NEL_THET-0.01

  NSEL,R,LOC,X,-0.001,R_F+R_F/100

NSEL,A,LOC,X,-0.001,0.001

ESLN,,1

NSEL,R,LOC,X,R_F/4-R_F/100,R_F/4+R_F/100

NSEL,R,LOC,Y,180+0.01,180-0.01

NSLE,R

*GET,NN2,NODE,0,NUM,MAX

NSEL,,LOC,Y,180+0.01,180-180/NEL_THET-0.01

  NSEL,R,LOC,X,-0.001,R_F+R_F/100

NSEL,A,LOC,X,-0.001,0.001

ESLN,,1

NSEL,R,LOC,X,R_F-R_F/100,R_F+R_F/100

NSEL,R,LOC,Y,180+0.01,180-0.01

NSLE,R

*GET,NN3,NODE,0,NUM,MAX
```

```
NSEL,,LOC,Y,-180-0.01,-180+180/NEL_THET+0.01

NSEL,R,LOC,X,-0.001,R_F+R_F/100

NSEL,A,LOC,X,-0.001,0.001

ESLN,,1

NSEL,R,LOC,X,R_F/4-R_F/100,R_F/4+R_F/100

NSEL,R,LOC,Y,-180-0.01,-180+0.01

NSLE,R

*GET,NN4,NODE,0,NUM,MAX

NSEL,,LOC,Y,-180-0.01,-180+180/NEL_THET+0.01

NSEL,R,LOC,X,-0.001,R_F+R_F/100

NSEL,A,LOC,X,-0.001,0.001

ESLN,,1

NSEL,R,LOC,X,R_F-R_F/100,R_F+R_F/100

NSEL,R,LOC,Y,-180-0.01,-180+0.01

NSLE,R

*GET,NN5,NODE,0,NUM,MAX

CSYS,0

/POST1

ALLSEL

PATH,K1,5,,30,20

PPATH,1,NN1

PPATH,2,NN2

PPATH,3,NN3

PPATH,4,NN4

PPATH,5,NN5

KCALC,1,1,3

!!! KCALC : Calculation of stress intensity factor (K1)
```