

Table 46a Input file, **egellipse.inp**, for **STAGS** for a "10-degree" model of the optimized equivalent isogrid-stiffened ellipsoidal shell with a -mode 1 initial imperfection of amplitude, Wimp=-0.2 inch. Plots of this "10-degree" model are displayed in Figs. 36 and 37 and Figs. 39 - 46.

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imperfect isogrid-stiffened equivalent ellipsoidal head X_320
  0  0  0  0  0  0  0  $B-1 IGRAV,ICHECK,ILIST,INCB,NRUNIT,NROTS,KDEV
 12  1  0 11  0,  $B-2 NUNITS,NUNITE,NSTFS,NINTS,NPATS,
  0  1  0  0  0  0  $B-2 NCONST,NIMPFS,INERT,NINSR,NPATX,NSTIFS
  2  0  0  0  0  0  $B-3 NTAM,NTAB,NTAW,NTAP,NTAMT,NGCP
-0.200  0  1  1  $B-5 WIMPFA, IMSTEP, IMMODE, IMRUN
 30 11,          $F-1 NROWS(1),NCOLS(1)
 20 11,          $F-1 NROWS(1),NCOLS(1)
 15 11,          $F-1 NROWS(1),NCOLS(1)
 13 11,          $F-1 NROWS(1),NCOLS(1)
 12 11,          $F-1 NROWS(1),NCOLS(1)
 11 11,          $F-1 NROWS(1),NCOLS(1)
 10 11,          $F-1 NROWS(1),NCOLS(1)
  9 11,          $F-1 NROWS(1),NCOLS(1)
  8 11,          $F-1 NROWS(1),NCOLS(1)
  7 11,          $F-1 NROWS(1),NCOLS(1)
  6 11,          $F-1 NROWS(1),NCOLS(1)
  5 11,          $F-1 NROWS(2),NCOLS(1)
  1  3  2  1      $G-1 MUNIT,MBOUND,NUNIT,NBOUND
  2  3  3  1      $G-1 MUNIT,MBOUND,NUNIT,NBOUND
  3  3  4  1      $G-1 MUNIT,MBOUND,NUNIT,NBOUND
  4  3  5  1      $G-1 MUNIT,MBOUND,NUNIT,NBOUND
  5  3  6  1      $G-1 MUNIT,MBOUND,NUNIT,NBOUND
  6  3  7  1      $G-1 MUNIT,MBOUND,NUNIT,NBOUND
  7  3  8  1      $G-1 MUNIT,MBOUND,NUNIT,NBOUND
  8  3  9  1      $G-1 MUNIT,MBOUND,NUNIT,NBOUND
  9  3 10  1      $G-1 MUNIT,MBOUND,NUNIT,NBOUND
 10  3 11  1      $G-1 MUNIT,MBOUND,NUNIT,NBOUND
 11  3 12  1      $G-1 MUNIT,MBOUND,NUNIT,NBOUND
 -1  -1          $H-1 For pole, rigid links (-1's let computer do the
$                  counting for you!)
  1  7  1  1  0  0  $I-1 ITAM,NESP,IPLST,ITANST,ICREEP,IPLANE
16.E+06 0.25 0.0 0.16 0.0 16.E+06 0. $I-2 E1,U12,G,RHO,A1,E2,A2
.0075 120000.,    $I-3 E(i), S(i)
.0088 138000.,    $I-3 E(i), S(i)
.0102 148000.,    $I-3 E(i), S(i)
.0122 156000.,    $I-3 E(i), S(i)
.0156 164000.,    $I-3 E(i), S(i)
.0200 165000.,    $I-3 E(i), S(i)
.0400 166000.,    $I-3 E(i), S(i)
  2  7  1  1  0  0  $I-1 ITAM,NESP,IPLST,ITANST,ICREEP,IPLANE
496894.4 .333 0. .004969 496894.4 0. $I-2 E1,U12,G,RHO,A1,E2,A2
.0075 3726.710,   $I-3 E(i), S(i)
.0088 4285.710,   $I-3 E(i), S(i)
.0102 4596.270,   $I-3 E(i), S(i)
.0122 4844.720,   $I-3 E(i), S(i)
.0156 5093.170,   $I-3 E(i), S(i)

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.0200 5124.220,    $I-3 E(i), S(i)
.0400 5155.280    $I-3 E(i), S(i)
C unit 1 = the spherical cap
 7  0  0  0  0  0  $M-1 ISHELL,IGLOBE,NROWS,NCOLS,NLAYS,NFABS
0.00 2.958103 0.0  10.0  49.5 $M-2 PHI1, PHI2, THETA1, THETA2, R
 0  0
410    $M-5 IWALL,IWIMP
    $N-1 KELT
 0  4  6  4  0    $P-1 IBLN(i), i=1,4, IBOND
111 111    $P-2 ITRA, IROT (conditions at pole)
 1  0  0  0  0  0  0 $Q-1 NSYS,NICS,NAMS,NUSS,NHINGE,etc.
 1  1  0    $Q-2 ISYS,NN,IFLG
-460.  5  3  0  0  0 $Q-3 P,LT,LD,LI,LJ,LAX
 0  0  0  0  0    $R-1 IPRD,IPRR,IPRE,IPRS,IPRP
C unit 2 = toroidal
 8  0  0  0  0  0  $M-1 ISHELL,IGLOBE,NROWS,NCOLS,NLAYS,NFABS
2.957441 6.69448 0. 10. .08364234 47.890324 $M-2 PH1,PH2,THET1,THET2,
C                                     $ Ra,Rb
 0  0    $M-5 IWALL,IWIMP
410    $N-1 KELT
 6  4  6  4  0    $P-1 IBLN(i), i=1,4, IBOND
 1  0  0  0  0  0  0 $Q-1 NSYS,NICS,NAMS,NUSS,NHINGE,etc.
 1  1  0    $Q-2 ISYS,NN,IFLG
-460.  5  3  0  0  0 $Q-3 P,LT,LD,LI,LJ,LAX
 0  0  0  0  0    $R-1 IPRD,IPRR,IPRE,IPRS,IPRP
C unit 3 = toroidal
 8  0  0  0  0  0  $M-1 ISHELL,IGLOBE,NROWS,NCOLS,NLAYS,NFABS
6.67782 10.67682 0. 10. .4623073 44.752884 $M-2 PH1,PH2,THET1,THET2,
C                                     $ Ra,Rb
 0  0    $M-5 IWALL,IWIMP
410    $N-1 KELT
 6  4  6  4  0    $P-1 IBLN(i), i=1,4, IBOND
 1  0  0  0  0  0  0 $Q-1 NSYS,NICS,NAMS,NUSS,NHINGE,etc.
 1  1  0    $Q-2 ISYS,NN,IFLG
-460.  5  3  0  0  0 $Q-3 P,LT,LD,LI,LJ,LAX
 0  0  0  0  0    $R-1 IPRD,IPRR,IPRE,IPRS,IPRP
C unit 4 = toroidal
 8  0  0  0  0  0  $M-1 ISHELL,IGLOBE,NROWS,NCOLS,NLAYS,NFABS
10.65673 15.12016 0. 10. 1.338907 40.095947 $M-2 PH1,PH2,THET1,THET2,
C                                     $ Ra,Rb
 0  0    $M-5 IWALL,IWIMP
410    $N-1 KELT
 6  4  6  4  0    $P-1 IBLN(i), i=1,4, IBOND
 1  0  0  0  0  0  0 $Q-1 NSYS,NICS,NAMS,NUSS,NHINGE,etc.
 1  1  0    $Q-2 ISYS,NN,IFLG
-460.  5  3  0  0  0 $Q-3 P,LT,LD,LI,LJ,LAX
 0  0  0  0  0    $R-1 IPRD,IPRR,IPRE,IPRS,IPRP
C unit 5 = toroidal
 8  0  0  0  0  0  $M-1 ISHELL,IGLOBE,NROWS,NCOLS,NLAYS,NFABS
15.08829 20.32144 0. 10. 2.895449 34.199043 $M-2 PH1,PH2,THET1,THET2,
C                                     $ Ra,Rb
 0  0    $M-5 IWALL,IWIMP
410    $N-1 KELT
 6  4  6  4  0    $P-1 IBLN(i), i=1,4, IBOND
 1  0  0  0  0  0  0 $Q-1 NSYS,NICS,NAMS,NUSS,NHINGE,etc.

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1 1 0 $Q-2 ISYS,NN,IFLG
-460. 5 3 0 0 0 $Q-3 P,LT,LD,LI,LJ,LAX
0 0 0 0 0 $R-1 IPRD,IPRR,IPRE,IPRS,IPRP
C unit 6 = toroidal
8 0 0 0 0 0 $M-1 ISHELL,IGLOBE,NROWS,NCOLS,NLAYS,NFABS
20.26536 26.78145 0. 10. 5.259145 27.465466 $M-2 PH1,PH2,THET1,THET2,
C $ Ra,Rb
0 0 $M-5 IWALL,IWIMP
410 $N-1 KELT
6 4 6 4 0 $P-1 IBLN(i), i=1,4, IBOND
1 0 0 0 0 0 0 $Q-1 NSYS,NICS,NAMS,NUSS,NHINGE,etc.
1 1 0 $Q-2 ISYS,NN,IFLG
-460. 5 3 0 0 0 $Q-3 P,LT,LD,LI,LJ,LAX
0 0 0 0 0 $R-1 IPRD,IPRR,IPRE,IPRS,IPRP
C unit 7 = toroidal
8 0 0 0 0 0 $M-1 ISHELL,IGLOBE,NROWS,NCOLS,NLAYS,NFABS
26.79548 32.96853 0. 10. 7.971097 21.436380 $M-2 PH1,PH2,THET1,THET2,
C $ Ra,Rb
0 0 $M-5 IWALL,IWIMP
410 $N-1 KELT
6 4 6 4 0 $P-1 IBLN(i), i=1,4, IBOND
1 0 0 0 0 0 0 $Q-1 NSYS,NICS,NAMS,NUSS,NHINGE,etc.
1 1 0 $Q-2 ISYS,NN,IFLG
-460. 5 3 0 0 0 $Q-3 P,LT,LD,LI,LJ,LAX
0 0 0 0 0 $R-1 IPRD,IPRR,IPRE,IPRS,IPRP
C unit 8 = toroidal
8 0 0 0 0 0 $M-1 ISHELL,IGLOBE,NROWS,NCOLS,NLAYS,NFABS
32.94721 39.85107 0. 10. 10.52211 16.758169 $M-2 PH1,PH2,THET1,THET2,
C $ Ra,Rb
0 0 $M-5 IWALL,IWIMP
410 $N-1 KELT
6 4 6 4 0 $P-1 IBLN(i), i=1,4, IBOND
1 0 0 0 0 0 0 $Q-1 NSYS,NICS,NAMS,NUSS,NHINGE,etc.
1 1 0 $Q-2 ISYS,NN,IFLG
-460. 5 3 0 0 0 $Q-3 P,LT,LD,LI,LJ,LAX
0 0 0 0 0 $R-1 IPRD,IPRR,IPRE,IPRS,IPRP
C unit 9 = toroidal
8 0 0 0 0 0 $M-1 ISHELL,IGLOBE,NROWS,NCOLS,NLAYS,NFABS
39.77901 48.82777 0. 10. 13.07984 12.785950 $M-2 PH1,PH2,THET1,THET2,
C $ Ra,Rb
0 0 $M-5 IWALL,IWIMP
410 $N-1 KELT
6 4 6 4 0 $P-1 IBLN(i), i=1,4, IBOND
1 0 0 0 0 0 0 $Q-1 NSYS,NICS,NAMS,NUSS,NHINGE,etc.
1 1 0 $Q-2 ISYS,NN,IFLG
-460. 5 3 0 0 0 $Q-3 P,LT,LD,LI,LJ,LAX
0 0 0 0 0 $R-1 IPRD,IPRR,IPRE,IPRS,IPRP
C unit 10 = toroidal
8 0 0 0 0 0 $M-1 ISHELL,IGLOBE,NROWS,NCOLS,NLAYS,NFABS
48.74254 60.90592 0. 10. 15.55374 9.5117826 $M-2 PH1,PH2,THET1,THET2,
C $ Ra,Rb
0 0 $M-5 IWALL,IWIMP
410 $N-1 KELT
6 4 6 4 0 $P-1 IBLN(i), i=1,4, IBOND

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1 0 0 0 0 0 0 $Q-1 NSYS,NICS,NAMS,NUSS,NHINGE,etc.
1 1 0 $Q-2 ISYS,NN,IFLG
-460. 5 3 0 0 0 $Q-3 P,LT,LD,LI,LJ,LAX
0 0 0 0 0 $R-1 IPRD,IPRR,IPRE,IPRS,IPRP
C unit 11 = toroidal
8 0 0 0 0 0 $M-1 ISHELL,IGLOBE,NROWS,NCOLS,NLAYS,NFABS
60.95361 75.15099 0. 10. 17.45365 7.3341379 $M-2 PH1,PH2,THET1,THET2,
C $ Ra,Rb
0 0 $M-5 IWALL,IWIMP
410 $N-1 KELT
6 4 6 4 0 $P-1 IBLN(i), i=1,4, IBOND
1 0 0 0 0 0 $Q-1 NSYS,NICS,NAMS,NUSS,NHINGE,etc.
1 1 0 $Q-2 ISYS,NN,IFLG
-460. 5 3 0 0 0 $Q-3 P,LT,LD,LI,LJ,LAX
0 0 0 0 0 $R-1 IPRD,IPRR,IPRE,IPRS,IPRP
C unit 12 = toroidal
8 0 0 0 0 0 $M-1 ISHELL,IGLOBE,NROWS,NCOLS,NLAYS,NFABS
75.3152 89.91051 0. 10.0 18.40842 6.3415871 $M-2 PH1,PH2,THET1,THET2,
C $ Ra,Rb
0 0 $M-5 IWALL,IWIMP
410 $N-1 KELT
6 4 0 4 0 $P-1 IBLN(i), i=1,4, IBOND
001 000 $P-2 ITRA, IROT (conditions at pole)
1 0 0 0 0 0 $Q-1 NSYS,NICS,NAMS,NUSS,NHINGE,etc.
1 1 0 $Q-2 ISYS,NN,IFLG
-460. 5 3 0 0 0 $Q-3 P,LT,LD,LI,LJ,LAX
0 0 0 0 0 $R-1 IPRD,IPRR,IPRE,IPRS,IPRP
$
$ ELEMENT UNIT for RIGID LINKS
$
$ S-1 records...
$USRPT unit row col ignore coords freedoms AUX #defs layer
1 1 1 1 3*0. 2*111 0 10 0
1 0 0 1 $ Increment variable above by value
END $ Computer does the counting for you!
$
$ Element records, "command method"
E120_ELEMENTS $ Ask for rigid link element
$N1 N2 N3 Kelt Ndefs, increment N1,N2,N3. N3 must be unity.
1 2 1 120 9 1 1 0 $ See T1 record. Want 9 elements
1. $ SCALE
END $ Computer did the counting, incrementation
0 $ No loads
0 $ No printed output
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