

MARCH 6, 1986

HOW TO MODEL CONCENTRATED LOADS WITH BOSOR4

Providing concentrated loads and moments can be tricky. This example should be helpful.

Figure 1 shows a cylindrical shell clamped at one end and free at the other. Three concentrated loads, a shear S and two moments, M_m and M_θ , are applied at the free end at circumferential coordinate $\theta = 0$. The so-called meridional moment M_m represents a force couple that lies in the vertical plane V , and the so-called circumferential moment M_θ represents a force couple that lies in the horizontal plane H . The concentrated shear load S is tangent to the free edge at $\theta = 0$ and lies in the horizontal plane H . All three concentrated loads are unit loads in this particular example.

There are several tricky aspects to this problem that must be emphasized at the outset:

1. This simple problem must be modelled with two segments because the simulation of both M_m and M_θ by line loads cannot be handled in the same segment. This is due to a limitation in BOSOR4 that the circumferential distributions of line loads V, H, M_m must be the same in a given segment. The trick used to get around this limitation is to introduce a phony short segment as shown in Fig. 2. The concentrated loads still occur at the same physical point, but the moment M_θ is at the first point in Segment 2, whereas S and M_m are at the last point in Segment 1. If you want, you can use very weak material in the phony segment, although I did not do that here.
2. The moment M_θ is simulated by a radial line load that varies as shown in Fig. 3.
3. Both negative and positive circumferential harmonics must be used to solve this problem.
4. The user should perform a convergence study with respect to the number of Fourier harmonics used to represent the concentrated loads. Since the problem requires both negative and positive harmonics, at least two separate runs checking convergence must be made, one for large negative harmonics and the other for large positive harmonics.

Figure 3 shows how the circumferential moment M_θ is represented by a radial line load H . Calculation of the maximum value, H_{max} , that yields a unit moment is demonstrated. (Of course, BOSOR4 can be used to find the response to concentrated loads and moments of any magnitude, not just unit loads.)

Figures 4 and 5 show how the meridional moment M_m and concentrated shear S are represented.

Figure 6 shows the results of the convergence study mentioned above.

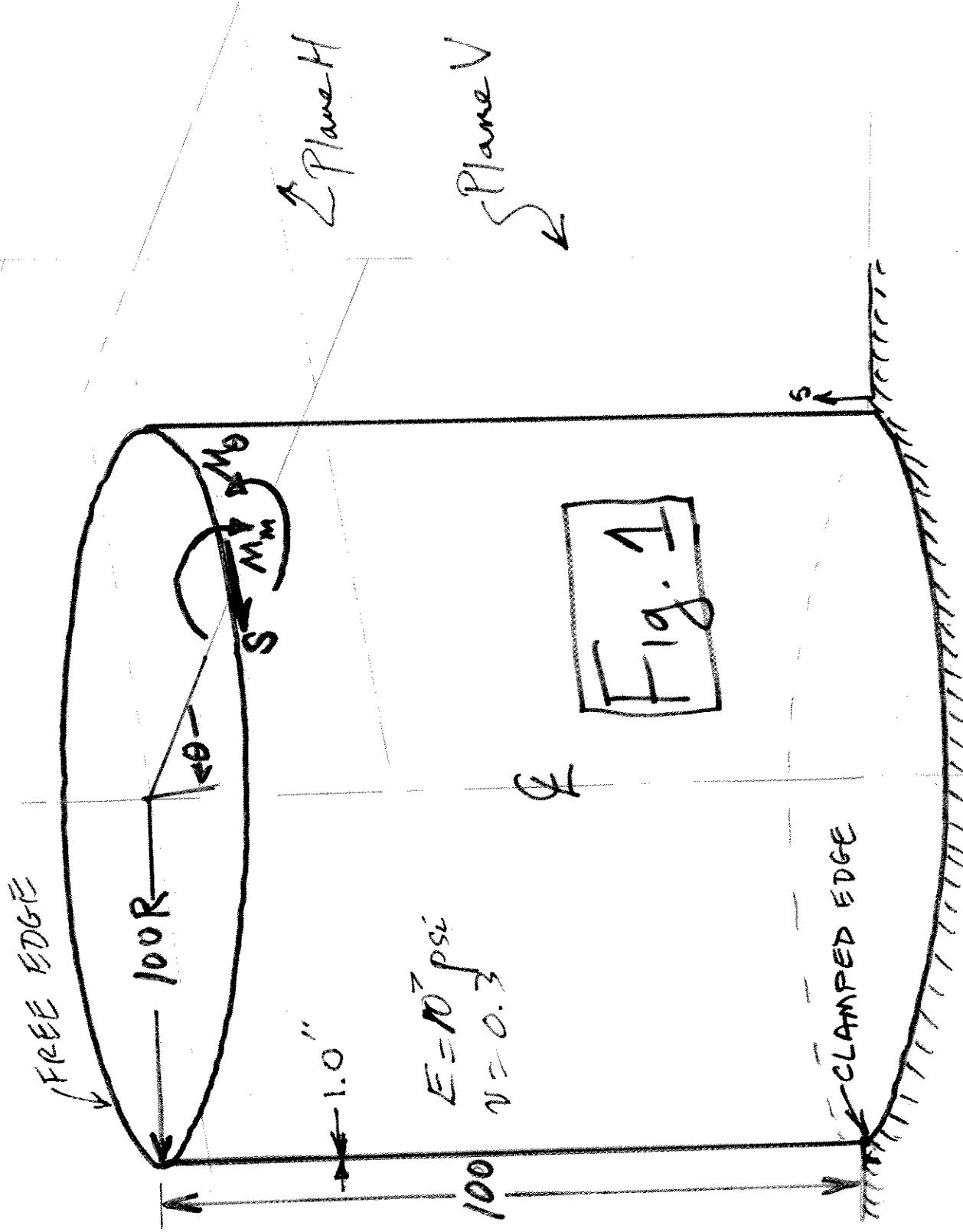
The pages following Fig. 6 represent the input data for BOSOR4 and abbreviated output. Plots follow the list output.

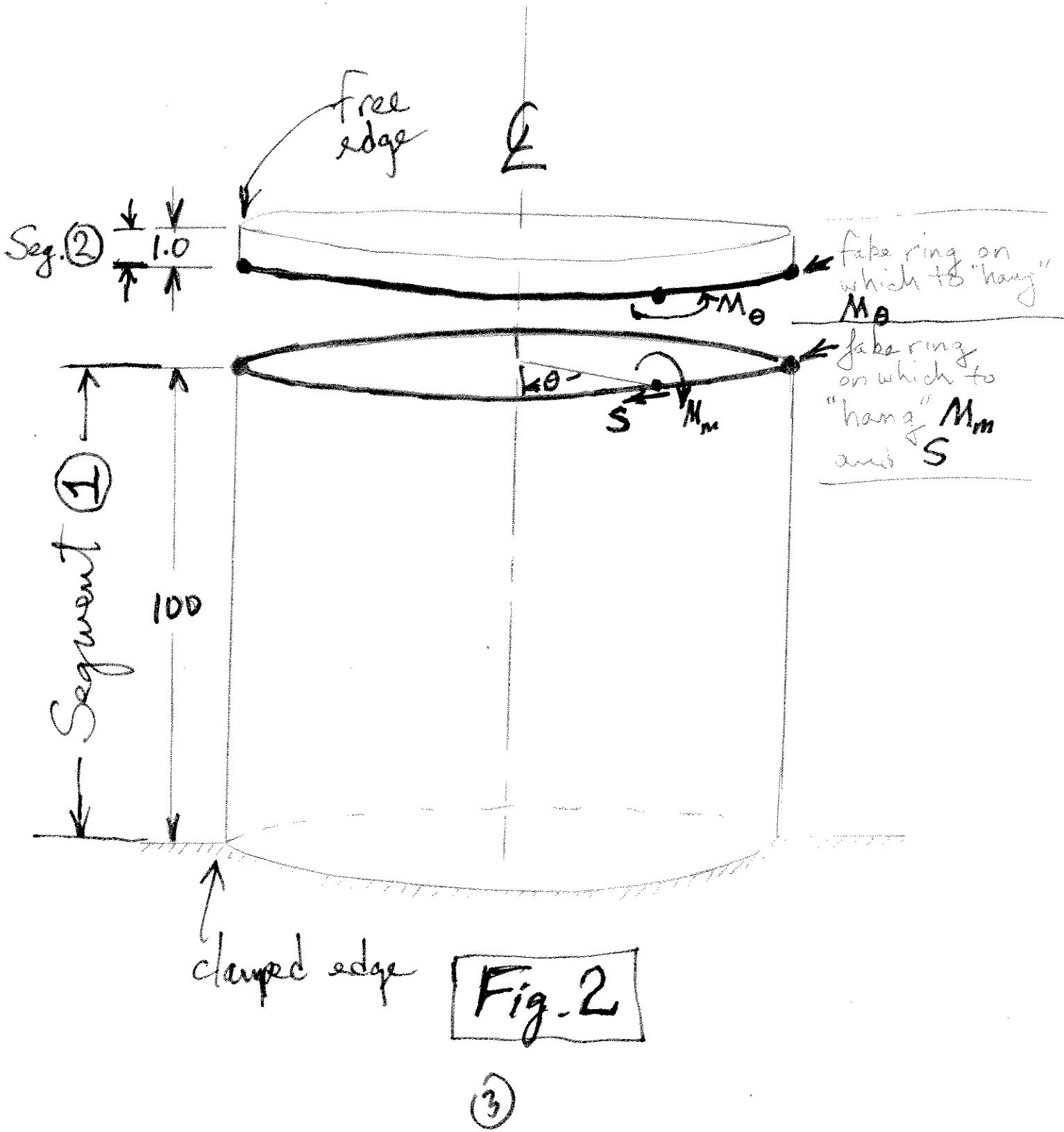
Please note that nodal points are concentrated near the free end in order to capture the steep gradients that occur there.

David Bushnell, March 6, 1986

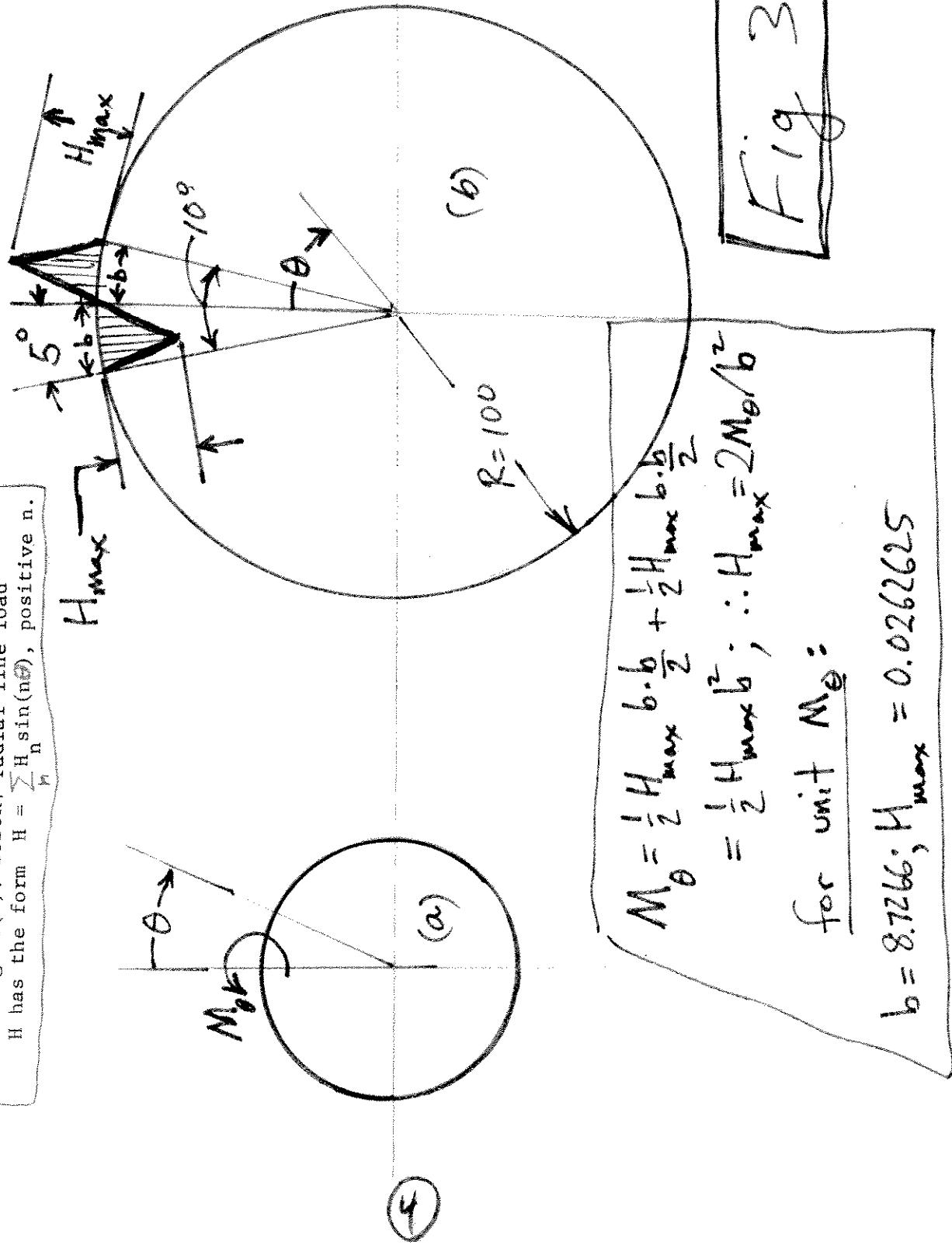
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CONCENTRATED LOADS IN BESOR 4

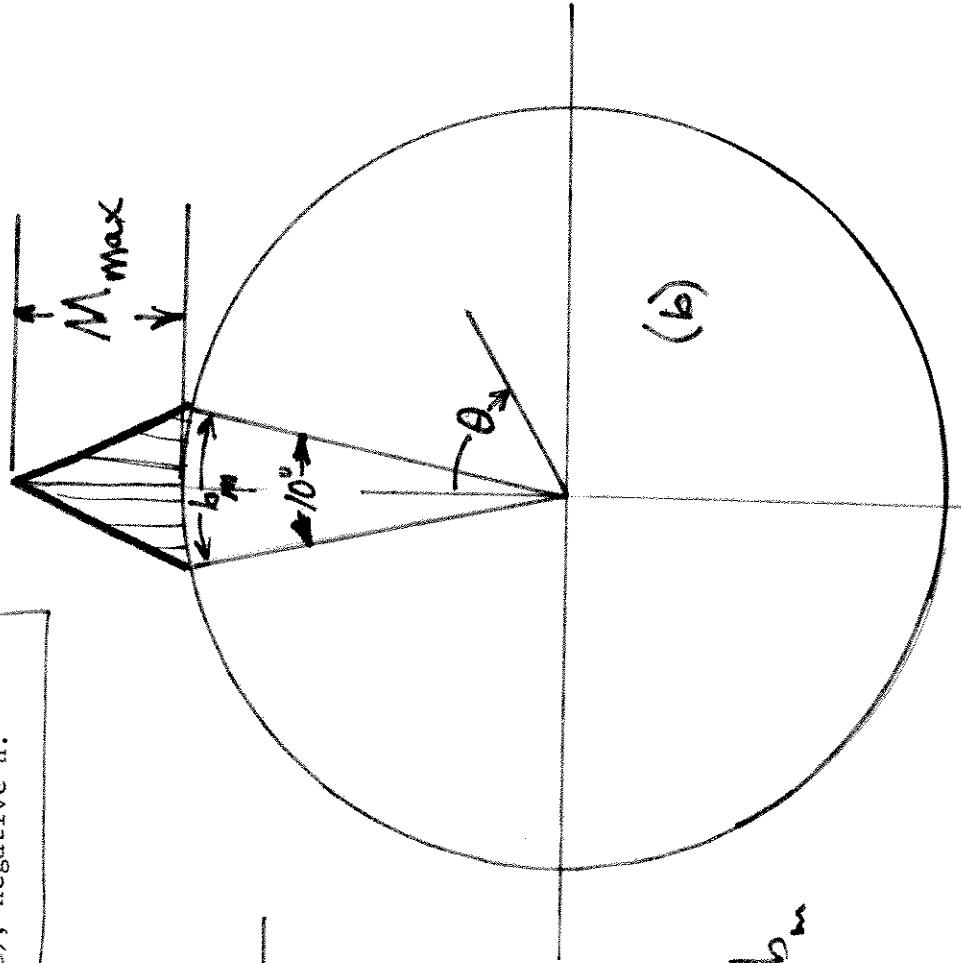




M_θ is introduced as a radial line load (f_k/m) that varies circumferentially as shown in Fig. 3(b). BOSOR4 radial line load H has the form $H = \sum_n H_n \sin(n\theta)$, positive n .



M_m is introduced as a radial line moment (in-lb/in) that varies circumferentially as shown in Fig. 4(b). M_m has the form $M_m = \sum M_n \cos(n\theta)$, negative n .



(a)

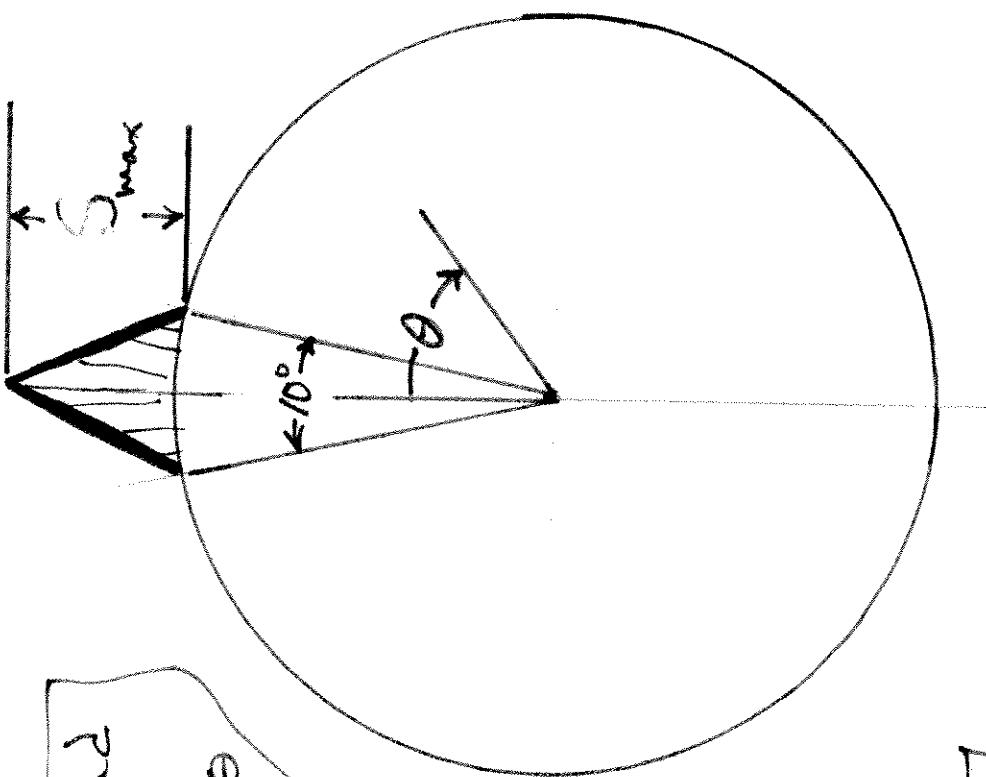
$$M_m = \frac{1}{2} M_{max} b_m$$

$$\therefore M_{max} = \frac{2 M_m}{b_m}$$

For unit M_m : $b_m = 17.4533$

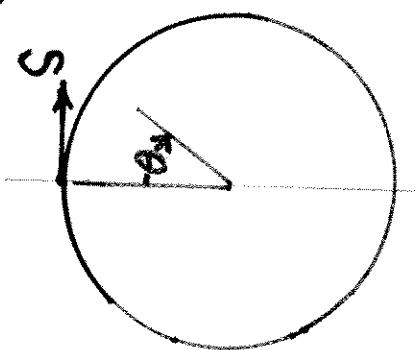
$$M_{max} = 0.11459$$

Fig. 4



Bosory Shear load
has the form
 $S = \frac{\sigma}{2} \sin \alpha$
position n.

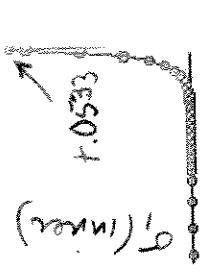
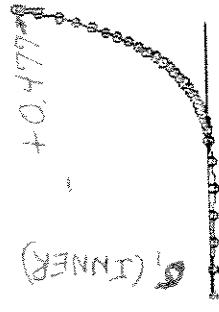
Fig 5



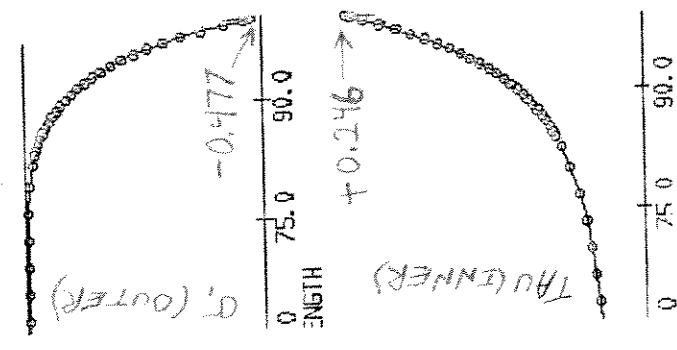
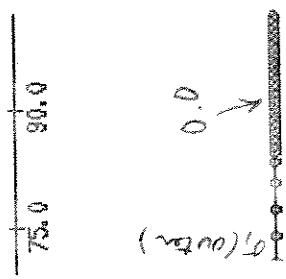
6

Circumferential Harmonics:

$$n = -40 \text{ to } +40 \quad n = -120 \text{ to } +120$$



$$n = +41 \text{ to } +120$$



(7)

Fig 6

Axial Coordinate At $\theta = 0$

DATA

INPUT

USER
5 pages

B

BOSOR4 CONCENTRATED MOMENTS AND SHEAR LOAD

3 \$ INDIC = analysis type indicator
2 \$ NPRT = output options (1=minimum, 2=medium, 3=maximum)
1 \$ ISTRES= output control (0=resultants, 1=sigma, 2=epsilon)
2 \$ NSEG = number of shell segments (less than 95)
-40 \$ NSTART= starting number of circ. waves (lin. stress anal-
ysis)
40 \$ NFIN = ending number of circ. waves (linear stress anal-
ysis)
1 \$ INCR = step in number of circ. waves (linear stress)
180 \$ THETAM= range of circumferential Fourier expansion & out-
put
H \$
H \$ SEGMENT NUMBER 1 1 1 1 1 1 1 1
H \$ NODAL POINT DISTRIBUTION FOLLOWS...
51 \$ NMESH = number of node points (5 = min.; 98 = max.)(1)
1 \$ NTYPEH= control integer (1 or 2 or 3) for nodal point spac-
ing
4 \$ NHVALU= number of callouts for nodal point spacing
1 \$ IHVALU(I)= Ith callout for nodal point spacing, IHVALU(1)
25 \$ IHVALU(I)= Ith callout for nodal point spacing, IHVALU(2)
26 \$ IHVALU(I)= Ith callout for nodal point spacing, IHVALU(3)
50 \$ IHVALU(I)= Ith callout for nodal point spacing, IHVALU(4)
1 \$ HVALU=meridional arc length between nodal points,HVALU(1)
1 \$ HVALU=meridional arc length between nodal points,HVALU(2)
0.2000000 \$ HVALU=meridional arc length between nodal points,HVALU(3)
0.2000000 \$ HVALU=meridional arc length between nodal points,HVALU(4)
H \$ REFERENCE SURFACE GEOMETRY FOLLOWS...
1 \$ NSHAPE= indicator (1,2 or 4) for geometry of meridian
100 \$ R1 = radius at beginning of segment (see p. 66)
0 \$ Z1 = global axial coordinate at beginning of segment
100 \$ R2 = radius at end of segment
100 \$ Z2 = global axial coordinate at end of segment
H \$ IMPERFECTION SHAPE FOLLOWS...
0 \$ IMP = indicator for imperfection (0=none, 1=some)
H \$ REFERENCE SURFACE LOCATION RELATIVE TO WALL
3 \$ NTYPEZ= control (1 or 3) for reference surface location
0.5000000 \$ ZVAL = distance from leftmost surf. to reference surf.
N \$ Do you want to print out r(s), r'(s), etc. for this segment?
H \$ DISCRETE RING INPUT FOLLOWS...
1 \$ NRINGS= number (max=20) of discrete rings in this segment
2 \$ NTYPES = control for identification of ring location (2=z,
3=r)
100 \$ Z(I) = axial coordinate of Ith ring, z(1)
0 \$ NTYPER= type (0 or 1 or 2 or 4 or 5) of discrete ring no.(
1) \$ K=elastic foundation modulus (e.g. lb/in**3)in this seg.
H \$ LINE LOAD INPUT FOLLOWS...

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1      $ LINAB= indicator (0, 1, 2 or 3) for load set A and B
H      $ LINE LOAD INPUT FOR LOAD SET "A" FOLLOWS
1      $ LINTYP= indicator (0, 1, 2 or 3) for type of line loads
4      $ NTYPEL=index (use 4) for input of nonsymmetric line loads
0      $ NLOAD(1)=indicator for axial load or disp.(0=none,1=some)
1      $ NLOAD(2)=indicator for shear load or disp.(0=none,1=some)
0      $ NLOAD(3)=indicator for radial load or disp.(0 or 1)
1      $ NLOAD(4)=indicator for line moment or rotation (0 or 1)
0.1145900 $ S(i)=fixed or initial shear load or displacement, S( 1)
0.1145900 $ M(i)=fixed or initial meridional moment or rot., M( 1)
3      $ NTHETA= number of circumferential callouts for load
2      $ NOPT   = control for how g(THETA) is to be input (1,2,or 3)
1      $ NODD   = control integer for oddness, evenness, of g(THETA)
0      $ THETA  = circumferential coordinate, in degrees, THETA( 1)
5      $ THETA  = circumferential coordinate, in degrees, THETA( 2)
180    $ THETA  = circumferential coordinate, in degrees, THETA( 3)
1      $ YPLUS  = value of g(THETA) at THETA( 1)
0      $ YPLUS  = value of g(THETA) at THETA( 2)
0      $ YPLUS  = value of g(THETA) at THETA( 3)
Y      $ Do you want to print out output Fourier expansion of load?
3      $ NTHETA= number of circumferential callouts for load
2      $ NOPT   = control for how g(THETA) is to be input (1,2,or 3)
1      $ NODD   = control integer for oddness, evenness, of g(THETA)
0      $ THETA  = circumferential coordinate, in degrees, THETA( 1)
5      $ THETA  = circumferential coordinate, in degrees, THETA( 2)
180    $ THETA  = circumferential coordinate, in degrees, THETA( 3)
1      $ YPLUS  = value of g(THETA) at THETA( 1)
0      $ YPLUS  = value of g(THETA) at THETA( 2)
0      $ YPLUS  = value of g(THETA) at THETA( 3)
Y      $ Do you want to print out output Fourier expansion of load?
H      $ DISTRIBUTED LOAD INPUT FOLLOWS...
0      $ IDISAB= indicator (0, 1, 2 or 3) for load set A and B
H      $ SHELL WALL CONSTRUCTION FOLLOWS...
2      $ NWALL=index (1, 2, 4, 5, 6, 7, 8) for wall construction
0.1000000E+08 $ E      = Young's modulus for skin
0.3000000 $ U      = Poisson's ratio for skin
0      $ SM =mass density of skin (e.g. alum.=.00025 lb-sec**2/in**4)
0      $ ALPHA = coefficient of thermal expansion
0      $ NRS   = control (0 or 1) for addition of smeared stiffeners
0      $ NSUR  = control for thickness input (0 or 1 or -1)
N      $ Do you want to print out ref. surf. location and thickness?
N      $ Do you want to print out the C(i,j) at meridional stations?
N      $ Do you want to print out distributed loads along meridian?
H      $
H      $ SEGMENT NUMBER      2      2      2      2      2      2      2      2
H      $ NODAL POINT DISTRIBUTION FOLLOWS...
5      $ NMESH = number of node points (5 = min.; 98 = max.)( 2)
3      $ NTYPEH= control integer (1 or 2 or 3) for nodal point spac-

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H      $ REFERENCE SURFACE GEOMETRY FOLLOWS...
      1      $ NSHAPE= indicator (1,2 or 4) for geometry of meridian
100    $ R1      = radius at beginning of segment (see p. 66)
100    $ Z1      = global axial coordinate at beginning of segment
100    $ R2      = radius at end of segment
101    $ Z2      = global axial coordinate at end of segment
H      $ IMPERFECTION SHAPE FOLLOWS...
      0      $ IMP    = indicator for imperfection (0=none, 1=some)
H      $ REFERENCE SURFACE LOCATION RELATIVE TO WALL
      3      $ NTYPEZ= control (1 or 3) for reference surface location
0.5000000 $ ZVAL   = distance from leftmost surf. to reference surf.
N      $ Do you want to print out r(s), r'(s), etc. for this segment?
H      $ DISCRETE RING INPUT FOLLOWS...
      1      $ NRINGS= number (max=20) of discrete rings in this segment
      2      $ NTYPE  = control for identification of ring location (2=z,
3=r)
      100    $ Z(I)   = axial coordinate of Ith ring, z( 1)
      0      $ NTYPER= type (0 or 1 or 2 or 4 or 5) of discrete ring no.( 1)
      0      $ K=elastic foundation modulus (e.g. 1b/in**3)in this seg.
H      $ LINE LOAD INPUT FOLLOWS...
      1      $ LINAB= indicator (0, 1, 2 or 3) for load set A and B
H      $ LINE LOAD INPUT FOR LOAD SET "A" FOLLOWS
      1      $ LINTYP= indicator (0, 1, 2 or 3) for type of line loads
      4      $ NTYPEL=index (use 4) for input of nonsymmetric line loads
      0      $ NLOAD(1)=indicator for axial load or disp.(0=none,1=some)
      0      $ NLOAD(2)=indicator for shear load or disp.(0=none,1=some)
      1      $ NLOAD(3)=indicator for radial load or disp.(0 or 1)
      0      $ NLOAD(4)=indicator for line moment or rotation (0 or 1)
0.2626250E-01 $ H(i)=fixed or initial radial load or displacement, H( 1)
      4      $ NTHETA= number of circumferential callouts for load
      2      $ NOPT   = control for how g(THETA) is to be input (1,2,or 3)
      2      $ NODD   = control integer for oddness, evenness, of g(THETA)
      0      $ THETA = circumferential coordinate, in degrees, THETA( 1)
2.500000  $ THETA = circumferential coordinate, in degrees, THETA( 2)
      5      $ THETA = circumferential coordinate, in degrees, THETA( 3)
     180    $ THETA = circumferential coordinate, in degrees, THETA( 4)
      0      $ YPLUS  = value of g(THETA) at THETA( 1)
      1      $ YPLUS  = value of g(THETA) at THETA( 2)
      0      $ YPLUS  = value of g(THETA) at THETA( 3)
      0      $ YPLUS  = value of g(THETA) at THETA( 4)
      Y      $ Do you want to print out output Fourier expansion of load?
H      $ DISTRIBUTED LOAD INPUT FOLLOWS...
      0      $ IDISAB= indicator (0, 1, 2 or 3) for load set A and B
H      $ SHELL WALL CONSTRUCTION FOLLOWS...
      2      $ NWALL=index (1, 2, 4, 5, 6, 7, 8) for wall construction
0.1000000E+08 $ E      = Young's modulus for skin

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0.3000000 \$ U = Poisson's ratio for skin
 0 \$ SM = mass density of skin (e.g. alum.=.00025 lb-sec**2/in**4)
 0 \$ ALPHA = coefficient of thermal expansion
 0 \$ NRS = control (0 or 1) for addition of smeared stiffeners
 0 \$ NSUR = control for thickness input (0 or 1 or -1)
 N \$ Do you want to print out ref. surf. location and thickness?
 N \$ Do you want to print out the C(i,j) at meridional stations?
 N \$ Do you want to print out distributed loads along meridian?
 H \$
 H \$ GLOBAL DATA BEGINS...
 1 \$ NLAST = plot options (-1=none, 0=geometry, 1=u,v,w)
 N \$ Are there any regions for which you want expanded plots?
 3 \$ NDIST = number of circ. stations for meridional output
 0 \$ THETA = circ. stations (in deg.) for meridional output. (1)
 20 \$ THETA = circ. stations (in deg.) for meridional output. (2)
 90 \$ THETA = circ. stations (in deg.) for meridional output. (3)
 3 \$ NCIRC = number of meridional stations for circ. distibutions
 1023 \$ ITTHETA= meridional location for circumferential output(1)
 1040 \$ ITTHETA= meridional location for circumferential output(2)
 1051 \$ ITTHETA= meridional location for circumferential output(3)
 46 \$ NTTHETA= number of output points along circ. from 0 to THETAM.
 180 \$ THETAS= Nx & Ny along this meridian used in buckling anal-
 ysis.
 0 \$ OMEGA = angular vel. about axis of revolution (rad/sec)
 1 \$ IOMGAB = control for OMEGA as "A" or "B" load (1 or 2)
 N \$ Do you want response to harmonic forcing (INDIC = 3 or 4)?
 H \$ CONSTRAINT CONDITIONS FOLLOW....
 2 \$ How many segments in the structure?
 H \$
 H \$ CONSTRAINT CONDITIONS FOR SEGMENT NO. 1 1 1 1
 H \$ POLES INPUT FOLLOWS...
 0 \$ Number of poles (places where r=0) in SEGMENT(1)
 H \$ INPUT FOR CONSTRAINTS TO GROUND FOLLOWS...
 1 \$ At how many stations is this segment constrained to ground?
 1 \$ INODE = nodal point number of constraint to ground, INODE(
 1) \$ IUSTAR=axial displacement constraint (0 or 1 or 2)
 1 \$ IVSTAR=circumferential displacement(0=free,1=0,2=imposed)
 1 \$ IWSTAR=radial displacement(0=free,1=constrained,2=imposed)
 1 \$ ICHI=meridional rotation (0=free,1=constrained,2=imposed)
 0 \$ D1 = radial component of offset of ground support
 0 \$ D2 = axial component of offset of ground support
 Y \$ Is this constraint the same for both prebuckling and buck-
 ling?
 H \$ JUNCTION CONDITION INPUT FOLLOWS...
 N \$ Is this segment joined to any lower-numbered segments?
 H \$
 H \$ CONSTRAINT CONDITIONS FOR SEGMENT NO. 2 2 2 2

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H      $ POLES INPUT FOLLOWS...
O      $ Number of poles (places where r=0) in SEGMENT( 2)
H      $ INPUT FOR CONSTRAINTS TO GROUND FOLLOWS...
O      $ At how many stations is this segment constrained to ground?
H      $ JUNCTION CONDITION INPUT FOLLOWS...
Y      $ Is this segment joined to any lower-numbered segments?
1      $ At how many stations is this segment joined to previous segs.?
1      $ INODE = node in current segment (ISEG) of junction, INODE(
1)
1      $ JSEG = segment no. of lowest segment involved in junction
51     $ JNODE = node in lowest segmnt (JSEG) of junction
1      $ IUSTAR= axial displacement (0=not slaved, 1=slaved)
1      $ IVSTAR= circumferential displacement (0=not slaved, 1=slaved)
1      $ IWSTAR= radial displacement (0=not slaved, 1=slaved)
1      $ ICHI = meridional rotation (0=not slaved, 1=slaved)
0      $ D1 = radial component of juncture gap
0      $ D2 = axial component of juncture gap
Y      $ Is this constraint the same for both prebuckling and buck-
ling?
H      $ RIGID BODY CONSTRAINT INPUT FOLLOWS...
N      $ Given existing constraints, are rigid body modes possible?
H      $ "GLOBAL3" QUESTIONS (AT END OF CASE)...
Y      $ Do you want to list output for segment( 1)
Y      $ Do you want to list output for segment( 2)
Y      $ Do you want to list forces in the discrete rings, if any?

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End of Bosur4 input data

BOSOR4 OUTPUT DATA

BOSOR4 CONCENTRATED MOMENTS AND SHEAR LOAD
SEGMENT NO. 1 IS A CYLINDER OR CONE.
END POINT COORDINATES (0, 1000E+03, 0, 000E+00) AND (0, 1000E+03, 0, 1000E+03)

LINE LOADS FOR LOAD SYSTEM "A", SEGMENT NO. 1
THERMAL OR MECHANICAL LINE OR DISTRIBUTED LOADS FOR THE 1 SEGMENT. VALID FOR LOADS EXPRESSED IN FORM $FS(S) \cdot Y(\Theta)$
CIRCUMFERENTIAL DISTRIBUTION OF AXIAL LINE LOADS $V(K)$, RADIAL LINE LOADS $H(K)$, AND LINE MOMENTS $M(K)$

INPUT LOAD DISTRIBUTION

CIRC. STA 1 CIRC. COORD. (DEGREES) = 0.000E+00	INPUT LOAD VALUE= 0.100E+01	CIRC. COORD. = 0.000E+00 INPUT LOAD VALUE= 0.100E+01
CIRC. STA 2 CIRC. COORD. (DEGREES) = 0.500E+01	INPUT LOAD VALUE= 0.000E+00	CIRC. COORD. = -0.500E+01 INPUT LOAD VALUE= 0.000E+00
CIRC. STA 3 CIRC. COORD. (DEGREES) = 0.180E+03	INPUT LOAD VALUE= 0.000E+00	CIRC. COORD. = -0.180E+03 INPUT LOAD VALUE= 0.000E+00

CALCULATED FOURIER HARMONICS OF LOAD

WAVE NO.N=-40, CIRC. HARMONIC AMPLITUDE A(N)=	8.84394E-03	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-39, CIRC. HARMONIC AMPLITUDE A(N)=	9.42911E-03	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-38, CIRC. HARMONIC AMPLITUDE A(N)=	1.002273E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-37, CIRC. HARMONIC AMPLITUDE A(N)=	1.063733E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-36, CIRC. HARMONIC AMPLITUDE A(N)=	1.12579E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-35, CIRC. HARMONIC AMPLITUDE A(N)=	1.18877E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-34, CIRC. HARMONIC AMPLITUDE A(N)=	1.25255E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-33, CIRC. HARMONIC AMPLITUDE A(N)=	1.31696E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-32, CIRC. HARMONIC AMPLITUDE A(N)=	1.38187E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-31, CIRC. HARMONIC AMPLITUDE A(N)=	1.44711E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-30, CIRC. HARMONIC AMPLITUDE A(N)=	1.51254E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-29, CIRC. HARMONIC AMPLITUDE A(N)=	1.57800E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-28, CIRC. HARMONIC AMPLITUDE A(N)=	1.64331E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-27, CIRC. HARMONIC AMPLITUDE A(N)=	1.70831E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-26, CIRC. HARMONIC AMPLITUDE A(N)=	1.77283E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-25, CIRC. HARMONIC AMPLITUDE A(N)=	1.83671E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-24, CIRC. HARMONIC AMPLITUDE A(N)=	1.89977E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-23, CIRC. HARMONIC AMPLITUDE A(N)=	1.96185E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-22, CIRC. HARMONIC AMPLITUDE A(N)=	2.02277E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-21, CIRC. HARMONIC AMPLITUDE A(N)=	2.08237E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-20, CIRC. HARMONIC AMPLITUDE A(N)=	2.14048E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-19, CIRC. HARMONIC AMPLITUDE A(N)=	2.19694E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-18, CIRC. HARMONIC AMPLITUDE A(N)=	2.25158E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-17, CIRC. HARMONIC AMPLITUDE A(N)=	2.30426E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-16, CIRC. HARMONIC AMPLITUDE A(N)=	2.35482E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-15, CIRC. HARMONIC AMPLITUDE A(N)=	2.40311E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-14, CIRC. HARMONIC AMPLITUDE A(N)=	2.44900E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-13, CIRC. HARMONIC AMPLITUDE A(N)=	2.49235E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-12, CIRC. HARMONIC AMPLITUDE A(N)=	2.53303E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-11, CIRC. HARMONIC AMPLITUDE A(N)=	2.57092E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-10, CIRC. HARMONIC AMPLITUDE A(N)=	2.60591E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-9, CIRC. HARMONIC AMPLITUDE A(N)=	2.64900E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-8, CIRC. HARMONIC AMPLITUDE A(N)=	2.63789E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-7, CIRC. HARMONIC AMPLITUDE A(N)=	2.66677E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-6, CIRC. HARMONIC AMPLITUDE A(N)=	2.69247E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-5, CIRC. HARMONIC AMPLITUDE A(N)=	2.71489E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-4, CIRC. HARMONIC AMPLITUDE A(N)=	2.73399E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-3, CIRC. HARMONIC AMPLITUDE A(N)=	2.74969E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-2, CIRC. HARMONIC AMPLITUDE A(N)=	2.76195E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=-1, CIRC. HARMONIC AMPLITUDE A(N)=	2.77074E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=0, CIRC. HARMONIC AMPLITUDE A(N)=	2.77600E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=1, CIRC. HARMONIC AMPLITUDE A(N)=	2.38889E-02	CIRC. DISTRIBUTION Y(THETA)= A*COS(N*THETA)
WAVE NO.N=2, CIRC. HARMONIC AMPLITUDE A(N)=	0.00000E+00	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
WAVE NO.N=3, CIRC. HARMONIC AMPLITUDE A(N)=	0.00000E+00	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)

This corresponds to Fig 2 & 4

13

WAVE NO.	WAVE NO.	HARMONIC AMPLITUDE A(N)=	DISTRIBUTION Y(THETA)=
4.	CIRC.	0.0000E+00.	A*SIN(N*THETA)
5.	CIRC.	0.0000E+00.	A*SIN(N*THETA)
6.	CIRC.	0.0000E+00.	A*SIN(N*THETA)
7.	CIRC.	0.0000E+00.	A*SIN(N*THETA)
8.	CIRC.	0.0000E+00.	A*SIN(N*THETA)
9.	CIRC.	0.0000E+00.	A*SIN(N*THETA)
10.	CIRC.	0.0000E+00.	A*SIN(N*THETA)
11.	CIRC.	0.0000E+00.	A*SIN(N*THETA)
12.	CIRC.	0.0000E+00.	A*SIN(N*THETA)
13.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
14.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
15.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
16.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
17.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
18.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
19.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
20.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
21.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
22.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
23.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
24.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
25.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
26.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
27.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
28.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
29.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
30.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
31.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
32.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
33.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
34.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
35.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
36.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
37.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
38.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
39.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
40.	CIRC.	0.0000E+00.	CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)

OUTPUT EXPANSION OF LOAD

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CIRC. STA. 129 CIRCUMFERRENTIAL COORDINATE = -2.5886E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 130 CIRCUMFERRENTIAL COORDINATE = -2.4682E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 131 CIRCUMFERRENTIAL COORDINATE = -2.3478E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 132 CIRCUMFERRENTIAL COORDINATE = -2.2274E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 133 CIRCUMFERRENTIAL COORDINATE = -2.1070E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 134 CIRCUMFERRENTIAL COORDINATE = -1.9866E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 135 CIRCUMFERRENTIAL COORDINATE = -1.8662E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 136 CIRCUMFERRENTIAL COORDINATE = -1.7458E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 137 CIRCUMFERRENTIAL COORDINATE = -1.6254E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 138 CIRCUMFERRENTIAL COORDINATE = -1.5050E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 139 CIRCUMFERRENTIAL COORDINATE = -1.3846E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 140 CIRCUMFERRENTIAL COORDINATE = -1.2642E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 141 CIRCUMFERRENTIAL COORDINATE = -1.1438E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 142 CIRCUMFERRENTIAL COORDINATE = -1.0234E+01 EXPANDED LOAD FUNCTION =
CIRC. STA. 143 CIRCUMFERRENTIAL COORDINATE = -9.0303E+00 EXPANDED LOAD FUNCTION =
CIRC. STA. 144 CIRCUMFERRENTIAL COORDINATE = -7.8263E+00 EXPANDED LOAD FUNCTION =
CIRC. STA. 145 CIRCUMFERRENTIAL COORDINATE = -6.6222E+00 EXPANDED LOAD FUNCTION =
CIRC. STA. 146 CIRCUMFERRENTIAL COORDINATE = -5.4182E+00 EXPANDED LOAD FUNCTION =
CIRC. STA. 147 CIRCUMFERRENTIAL COORDINATE = -4.2142E+00 EXPANDED LOAD FUNCTION =
CIRC. STA. 148 CIRCUMFERRENTIAL COORDINATE = -3.0102E+00 EXPANDED LOAD FUNCTION =

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CIRC. STA. 149 CIRCUMFERENTIAL COORDINATE = -1.8062E+00 EXPANDED LOAD FUNCTION = 6.66517E-01
 CIRC. STA. 150 CIRCUMFERENTIAL COORDINATE = -6.0217E-01 EXPANDED LOAD FUNCTION = 8.00265E-01
 CIRC. STA. 151 CIRCUMFERENTIAL COORDINATE = 6.0184E-01 EXPANDED LOAD FUNCTION = 8.00284E-01
 CIRC. STA. 152 CIRCUMFERENTIAL COORDINATE = 1.8059E+00 EXPANDED LOAD FUNCTION = 6.66568E-01
 CIRC. STA. 153 CIRCUMFERENTIAL COORDINATE = 3.0999E+00 EXPANDED LOAD FUNCTION = 4.46173E-01
 CIRC. STA. 154 CIRCUMFERENTIAL COORDINATE = 4.2139E+00 EXPANDED LOAD FUNCTION = 2.1224E-01
 CIRC. STA. 155 CIRCUMFERENTIAL COORDINATE = 5.4179E+00 EXPANDED LOAD FUNCTION = 3.25416E-02
 CIRC. STA. 156 CIRCUMFERENTIAL COORDINATE = 6.6219E+00 EXPANDED LOAD FUNCTION = -5.70932E-02
 CIRC. STA. 157 CIRCUMFERENTIAL COORDINATE = 7.8259E+00 EXPANDED LOAD FUNCTION = -6.22974E-02
 CIRC. STA. 158 CIRCUMFERENTIAL COORDINATE = 9.0299E+00 EXPANDED LOAD FUNCTION = -1.97994E-02
 CIRC. STA. 159 CIRCUMFERENTIAL COORDINATE = 1.0234E+01 EXPANDED LOAD FUNCTION = 2.55065E-02
 CIRC. STA. 160 CIRCUMFERENTIAL COORDINATE = 1.1438E+01 EXPANDED LOAD FUNCTION = 4.31693E-02
 CIRC. STA. 161 CIRCUMFERENTIAL COORDINATE = 1.2642E+01 EXPANDED LOAD FUNCTION = 2.82736E-02
 CIRC. STA. 162 CIRCUMFERENTIAL COORDINATE = 1.3846E+01 EXPANDED LOAD FUNCTION = -2.75705E-03
 CIRC. STA. 163 CIRCUMFERENTIAL COORDINATE = 1.5050E+01 EXPANDED LOAD FUNCTION = -2.68190E-02
 CIRC. STA. 164 CIRCUMFERENTIAL COORDINATE = 1.6254E+01 EXPANDED LOAD FUNCTION = -2.94754E-02
 CIRC. STA. 165 CIRCUMFERENTIAL COORDINATE = 1.7458E+01 EXPANDED LOAD FUNCTION = -1.22873E-02
 CIRC. STA. 166 CIRCUMFERENTIAL COORDINATE = 1.8662E+01 EXPANDED LOAD FUNCTION = 1.07556E-02
 CIRC. STA. 167 CIRCUMFERENTIAL COORDINATE = 1.9866E+01 EXPANDED LOAD FUNCTION = 2.38710E-02
 CIRC. STA. 168 CIRCUMFERENTIAL COORDINATE = 2.1070E+01 EXPANDED LOAD FUNCTION = 1.97172E-02
 CIRC. STA. 169 CIRCUMFERENTIAL COORDINATE = 2.2274E+01 EXPANDED LOAD FUNCTION = 2.99607E-03
 CIRC. STA. 170 CIRCUMFERENTIAL COORDINATE = 2.3478E+01 EXPANDED LOAD FUNCTION = -1.39846E-02
 CIRC. STA. 171 CIRCUMFERENTIAL COORDINATE = 2.4682E+01 EXPANDED LOAD FUNCTION = -2.00650E-02

SHEAR LINE LOADS S(k)

INPUT LOAD DISTRIBUTION
 CIRC. STA. 1 CIRC. COORD.(DEGREES) = 0.0000E+00 INPUT LOAD VALUE= 0.100E+01 CIRC. COORD.= 0.000E+00 INPUT LOAD VALUE= 0.100E+01
 CIRC. STA. 2 CIRC. COORD.(DEGREES) = 0.5000E+01 INPUT LOAD VALUE= 0.000E+00 CIRC. COORD.= -0.500E+01 INPUT LOAD VALUE= 0.000E+00
 CIRC. STA. 3 CIRC. COORD.(DEGREES) = 0.180E+03 INPUT LOAD VALUE= 0.000E+00 CIRC. COORD.= -0.180E+03 INPUT LOAD VALUE= 0.000E+00

CALCULATED FOURIER HARMONICS OF LOAD

WAVE NO. N= -40. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -39. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -38. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -37. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -36. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -35. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -34. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -33. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -32. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -31. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -30. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -29. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -28. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -27. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -26. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -25. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -24. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -23. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -22. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -21. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -20. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -19. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -18. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -17. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO. N= -16. CIRC. HARMONIC AMPLITUDE A(N)= 0.0000E+00. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)

(15)

Fig. 2 & 4

Fig. 2 & 5

WAVE NO.	HARMONIC	AMPLITUDE	A(N)
-15.	CIRC.	HARMONIC AMPLITUDE	A(N)
-14.	CIRC.	HARMONIC AMPLITUDE	A(N)
-13.	CIRC.	HARMONIC AMPLITUDE	A(N)
-12.	CIRC.	HARMONIC AMPLITUDE	A(N)
-11.	CIRC.	HARMONIC AMPLITUDE	A(N)
-10.	CIRC.	HARMONIC AMPLITUDE	A(N)
-9.	CIRC.	HARMONIC AMPLITUDE	A(N)
-8.	CIRC.	HARMONIC AMPLITUDE	A(N)
-7.	CIRC.	HARMONIC AMPLITUDE	A(N)
-6.	CIRC.	HARMONIC AMPLITUDE	A(N)
-5.	CIRC.	HARMONIC AMPLITUDE	A(N)
-4.	CIRC.	HARMONIC AMPLITUDE	A(N)
-3.	CIRC.	HARMONIC AMPLITUDE	A(N)
-2.	CIRC.	HARMONIC AMPLITUDE	A(N)
-1.	CIRC.	HARMONIC AMPLITUDE	A(N)
0.	CIRC.	HARMONIC AMPLITUDE	A(N)
1.	CIRC.	HARMONIC AMPLITUDE	A(N)
2.	CIRC.	HARMONIC AMPLITUDE	A(N)
3.	CIRC.	HARMONIC AMPLITUDE	A(N)
4.	CIRC.	HARMONIC AMPLITUDE	A(N)
5.	CIRC.	HARMONIC AMPLITUDE	A(N)
6.	CIRC.	HARMONIC AMPLITUDE	A(N)
7.	CIRC.	HARMONIC AMPLITUDE	A(N)
8.	CIRC.	HARMONIC AMPLITUDE	A(N)
9.	CIRC.	HARMONIC AMPLITUDE	A(N)
10.	CIRC.	HARMONIC AMPLITUDE	A(N)
11.	CIRC.	HARMONIC AMPLITUDE	A(N)
12.	CIRC.	HARMONIC AMPLITUDE	A(N)
13.	CIRC.	HARMONIC AMPLITUDE	A(N)
14.	CIRC.	HARMONIC AMPLITUDE	A(N)
15.	CIRC.	HARMONIC AMPLITUDE	A(N)
16.	CIRC.	HARMONIC AMPLITUDE	A(N)
17.	CIRC.	HARMONIC AMPLITUDE	A(N)
18.	CIRC.	HARMONIC AMPLITUDE	A(N)
19.	CIRC.	HARMONIC AMPLITUDE	A(N)
20.	CIRC.	HARMONIC AMPLITUDE	A(N)
21.	CIRC.	HARMONIC AMPLITUDE	A(N)
22.	CIRC.	HARMONIC AMPLITUDE	A(N)
23.	CIRC.	HARMONIC AMPLITUDE	A(N)
24.	CIRC.	HARMONIC AMPLITUDE	A(N)
25.	CIRC.	HARMONIC AMPLITUDE	A(N)
26.	CIRC.	HARMONIC AMPLITUDE	A(N)
27.	CIRC.	HARMONIC AMPLITUDE	A(N)
28.	CIRC.	HARMONIC AMPLITUDE	A(N)
29.	CIRC.	HARMONIC AMPLITUDE	A(N)
30.	CIRC.	HARMONIC AMPLITUDE	A(N)
31.	CIRC.	HARMONIC AMPLITUDE	A(N)
32.	CIRC.	HARMONIC AMPLITUDE	A(N)
33.	CIRC.	HARMONIC AMPLITUDE	A(N)
34.	CIRC.	HARMONIC AMPLITUDE	A(N)
35.	CIRC.	HARMONIC AMPLITUDE	A(N)
36.	CIRC.	HARMONIC AMPLITUDE	A(N)
37.	CIRC.	HARMONIC AMPLITUDE	A(N)
38.	CIRC.	HARMONIC AMPLITUDE	A(N)
39.	CIRC.	HARMONIC AMPLITUDE	A(N)
40.	CIRC.	HARMONIC AMPLITUDE	A(N)

OUTPUT EXPANSION OF LOAD

CIRC: SIA: 129 CIRCUMFERENTIAL COORDINATE = -2.5886E+01 EXPANDED LOAD SECTION

CIRC. STA. 130 CIRCUMFERNENTIAL COORDINATE = -2.4682E+01 EXPANDED LOAD FUNCTION = -2.00647E-02
 CIRC. STA. 131 CIRCUMFERNENTIAL COORDINATE = -2.3478E+01 EXPANDED LOAD FUNCTION = -1.39886E-02
 CIRC. STA. 132 CIRCUMFERNENTIAL COORDINATE = -2.2274E+01 EXPANDED LOAD FUNCTION = 2.99093E-03
 CIRC. STA. 133 CIRCUMFERNENTIAL COORDINATE = -2.1070E+01 EXPANDED LOAD FUNCTION = 1.97140E-02
 CIRC. STA. 134 CIRCUMFERNENTIAL COORDINATE = -1.9866E+01 EXPANDED LOAD FUNCTION = 2.38722E-02
 CIRC. STA. 135 CIRCUMFERNENTIAL COORDINATE = -1.8662E+01 EXPANDED LOAD FUNCTION = 1.07811E-02
 CIRC. STA. 136 CIRCUMFERNENTIAL COORDINATE = -1.7458E+01 EXPANDED LOAD FUNCTION = -1.22811E-02
 CIRC. STA. 137 CIRCUMFERNENTIAL COORDINATE = -1.6254E+01 EXPANDED LOAD FUNCTION = -2.94730E-02
 CIRC. STA. 138 CIRCUMFERNENTIAL COORDINATE = -1.5050E+01 EXPANDED LOAD FUNCTION = -2.68229E-02
 CIRC. STA. 139 CIRCUMFERNENTIAL COORDINATE = -1.3846E+01 EXPANDED LOAD FUNCTION = -2.76536E-03
 CIRC. STA. 140 CIRCUMFERNENTIAL COORDINATE = -1.2642E+01 EXPANDED LOAD FUNCTION = -2.82664E-02
 CIRC. STA. 141 CIRCUMFERNENTIAL COORDINATE = -1.1438E+01 EXPANDED LOAD FUNCTION = 4.31693E-02
 CIRC. STA. 142 CIRCUMFERNENTIAL COORDINATE = -1.0234E+01 EXPANDED LOAD FUNCTION = 2.55159E-02
 CIRC. STA. 143 CIRCUMFERNENTIAL COORDINATE = -9.00303E+00 EXPANDED LOAD FUNCTION = -1.97856E-02
 CIRC. STA. 144 CIRCUMFERNENTIAL COORDINATE = -7.8263E+00 EXPANDED LOAD FUNCTION = -6.22902E-02
 CIRC. STA. 145 CIRCUMFERNENTIAL COORDINATE = -6.6222E+00 EXPANDED LOAD FUNCTION = -5.71050E-02
 CIRC. STA. 146 CIRCUMFERNENTIAL COORDINATE = -5.4182E+00 EXPANDED LOAD FUNCTION = 3.25043E-02
 CIRC. STA. 147 CIRCUMFERNENTIAL COORDINATE = -4.2142E+00 EXPANDED LOAD FUNCTION = 2.12181E-01
 CIRC. STA. 148 CIRCUMFERNENTIAL COORDINATE = -3.0102E+00 EXPANDED LOAD FUNCTION = 4.46107E-01
 CIRC. STA. 149 CIRCUMFERNENTIAL COORDINATE = -1.8062E+00 EXPANDED LOAD FUNCTION = 6.66511E-01
 CIRC. STA. 150 CIRCUMFERNENTIAL COORDINATE = -6.0217E-01 EXPANDED LOAD FUNCTION = 8.00265E-01
 CIRC. STA. 151 CIRCUMFERNENTIAL COORDINATE = 6.0184E-01 EXPANDED LOAD FUNCTION = 8.00284E-01
 CIRC. STA. 152 CIRCUMFERNENTIAL COORDINATE = 1.8059E+00 EXPANDED LOAD FUNCTION = 6.66568E-01
 CIRC. STA. 153 CIRCUMFERNENTIAL COORDINATE = 3.0099E+00 EXPANDED LOAD FUNCTION = 4.46173E-01
 CIRC. STA. 154 CIRCUMFERNENTIAL COORDINATE = 4.2139E+00 EXPANDED LOAD FUNCTION = 2.12240E-01
 CIRC. STA. 155 CIRCUMFERNENTIAL COORDINATE = 5.4179E+00 EXPANDED LOAD FUNCTION = 3.25416E-02
 CIRC. STA. 156 CIRCUMFERNENTIAL COORDINATE = 6.6219E+00 EXPANDED LOAD FUNCTION = -5.70931E-02
 CIRC. STA. 157 CIRCUMFERNENTIAL COORDINATE = 7.8259E+00 EXPANDED LOAD FUNCTION = -6.22974E-02
 CIRC. STA. 158 CIRCUMFERNENTIAL COORDINATE = 9.0299E+00 EXPANDED LOAD FUNCTION = 4.46173E-01
 CIRC. STA. 159 CIRCUMFERNENTIAL COORDINATE = 1.0234E+01 EXPANDED LOAD FUNCTION = 2.55065E-02
 CIRC. STA. 160 CIRCUMFERNENTIAL COORDINATE = 1.1438E+01 EXPANDED LOAD FUNCTION = 4.31693E-02
 CIRC. STA. 161 CIRCUMFERNENTIAL COORDINATE = 1.2642E+01 EXPANDED LOAD FUNCTION = 2.82736E-02
 CIRC. STA. 162 CIRCUMFERNENTIAL COORDINATE = 1.3846E+01 EXPANDED LOAD FUNCTION = -2.75703E-03
 CIRC. STA. 163 CIRCUMFERNENTIAL COORDINATE = 1.5050E+01 EXPANDED LOAD FUNCTION = -1.97994E-02
 CIRC. STA. 164 CIRCUMFERNENTIAL COORDINATE = 1.6254E+01 EXPANDED LOAD FUNCTION = -2.68190E-02
 CIRC. STA. 165 CIRCUMFERNENTIAL COORDINATE = 1.7458E+01 EXPANDED LOAD FUNCTION = -2.94754E-02
 CIRC. STA. 166 CIRCUMFERNENTIAL COORDINATE = 1.8662E+01 EXPANDED LOAD FUNCTION = -1.22873E-02
 CIRC. STA. 167 CIRCUMFERNENTIAL COORDINATE = 1.9866E+01 EXPANDED LOAD FUNCTION = 1.07556E-02
 CIRC. STA. 168 CIRCUMFERNENTIAL COORDINATE = 2.1070E+01 EXPANDED LOAD FUNCTION = 2.38710E-02
 CIRC. STA. 169 CIRCUMFERNENTIAL COORDINATE = 2.2274E+01 EXPANDED LOAD FUNCTION = 1.97172E-02
 CIRC. STA. 170 CIRCUMFERNENTIAL COORDINATE = 2.3478E+01 EXPANDED LOAD FUNCTION = 2.99607E-03
 CIRC. STA. 171 CIRCUMFERNENTIAL COORDINATE = 2.4682E+01 EXPANDED LOAD FUNCTION = -1.39846E-02
 CIRC. STA. 172 CIRCUMFERNENTIAL COORDINATE = 2.5886E+01 EXPANDED LOAD FUNCTION = -2.00650E-02

PHYSICAL PROPERTIES OF SEGMENT NO. 1

MODULUS OF ELASTICITY= 0.10000E+08 POISSON RATIO= 0.30000E+00 SHELL DENSITY = 0.00000E+00 THERMAL EXP COEF. = 0.00000E+00

SEGMENT NO. 2 IS A CYLINDER OR CONE.

END POINT COORDINATES (0.1000E+03, 0.1000E+03) AND (0.1000E+03, 0.1010E+03)

LINE LOADS FOR LOAD SYSTEM "A", SEGMENT NO. 2.

CIRCUMFERNENTIAL DISTRIBUTION OF AXIAL LINE LOADS V(K), RADIAL LINE LOADS H(K), AND LINE MOMENTS M(K)

INPUT LOAD DISTRIBUTION
 CIRC. STA. 1 CIRC. COORD. (DEGREES) = 0.000E+00 INPUT LOAD VALUE= 0.000E+00 CIRC. COORD.= 0.100E+01 INPUT LOAD VALUE= 0.000E+00
 CIRC. STA. 2 CIRC. COORD. (DEGREES) = 0.250E+01 INPUT LOAD VALUE= 0.100E+01 CIRC. COORD.= -0.250E+01 INPUT LOAD VALUE=-0.100E+01

to simulate no. 0

Bag in 2
5 days

(17)

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CIRC. STA 3 CIRC. COORD.(DEGREES) = 0.500E+01 INPUT LOAD VALUE= 0.000E+00
CIRC. STA 4 CIRC. COORD.(DEGREES) = 0.180E+03 INPUT LOAD VALUE= 0.000E+00
CIRC. COORD. ==-0.500E+01 INPUT LOAD VALUE= 0.000E+00
CIRC. COORD. ==-0.180E+03 INPUT LOAD VALUE= 0.000E+00

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CALCULATED FOURIER HARMONICS OF LOAD

18

WAVE NO.N= 16. CIRC. HARMONIC AMPLITUDE A(N)= 1.71417E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 17. CIRC. HARMONIC AMPLITUDE A(N)= 1.79216E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 18. CIRC. HARMONIC AMPLITUDE A(N)= 1.86527E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 19. CIRC. HARMONIC AMPLITUDE A(N)= 1.93335E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 20. CIRC. HARMONIC AMPLITUDE A(N)= 1.99624E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 21. CIRC. HARMONIC AMPLITUDE A(N)= 2.05382E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 22. CIRC. HARMONIC AMPLITUDE A(N)= 2.10597E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 23. CIRC. HARMONIC AMPLITUDE A(N)= 2.15261E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 24. CIRC. HARMONIC AMPLITUDE A(N)= 2.19367E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 25. CIRC. HARMONIC AMPLITUDE A(N)= 2.22989E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 26. CIRC. HARMONIC AMPLITUDE A(N)= 2.25884E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 27. CIRC. HARMONIC AMPLITUDE A(N)= 2.28291E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 28. CIRC. HARMONIC AMPLITUDE A(N)= 2.30131E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 29. CIRC. HARMONIC AMPLITUDE A(N)= 2.31407E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 30. CIRC. HARMONIC AMPLITUDE A(N)= 2.32123E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 31. CIRC. HARMONIC AMPLITUDE A(N)= 2.32286E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 32. CIRC. HARMONIC AMPLITUDE A(N)= 2.31905E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 33. CIRC. HARMONIC AMPLITUDE A(N)= 2.30988E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 34. CIRC. HARMONIC AMPLITUDE A(N)= 2.29549E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 35. CIRC. HARMONIC AMPLITUDE A(N)= 2.27601E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 36. CIRC. HARMONIC AMPLITUDE A(N)= 2.25158E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 37. CIRC. HARMONIC AMPLITUDE A(N)= 2.22238E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 38. CIRC. HARMONIC AMPLITUDE A(N)= 2.18858E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 39. CIRC. HARMONIC AMPLITUDE A(N)= 2.15037E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)
 WAVE NO.N= 40. CIRC. HARMONIC AMPLITUDE A(N)= 2.10796E-02. CIRC. DISTRIBUTION Y(THETA)= A*SIN(N*THETA)

OUTPUT EXPANSION OF LOAD

CIRC. STA. 129 CIRCUMFERNENTIAL COORDINATE = -2.5886E+01 EXPANDED LOAD FUNCTION = 3.87997E-02
 CIRC. STA. 130 CIRCUMFERNENTIAL COORDINATE = -2.4682E+01 EXPANDED LOAD FUNCTION = 5.73784E-03
 CIRC. STA. 131 CIRCUMFERNENTIAL COORDINATE = -2.3478E+01 EXPANDED LOAD FUNCTION = -3.48890E-02
 CIRC. STA. 132 CIRCUMFERNENTIAL COORDINATE = -2.2274E+01 EXPANDED LOAD FUNCTION = -5.47210E-02
 CIRC. STA. 133 CIRCUMFERNENTIAL COORDINATE = -2.1070E+01 EXPANDED LOAD FUNCTION = -3.71160E-02
 CIRC. STA. 134 CIRCUMFERNENTIAL COORDINATE = -1.9866E+01 EXPANDED LOAD FUNCTION = 9.77481E-03
 CIRC. STA. 135 CIRCUMFERNENTIAL COORDINATE = -1.8662E+01 EXPANDED LOAD FUNCTION = 5.57399E-02
 CIRC. STA. 136 CIRCUMFERNENTIAL COORDINATE = -1.7458E+01 EXPANDED LOAD FUNCTION = 6.71518E-02
 CIRC. STA. 137 CIRCUMFERNENTIAL COORDINATE = -1.6254E+01 EXPANDED LOAD FUNCTION = 3.04099E-02
 CIRC. STA. 138 CIRCUMFERNENTIAL COORDINATE = -1.5050E+01 EXPANDED LOAD FUNCTION = -3.53669E-02
 CIRC. STA. 139 CIRCUMFERNENTIAL COORDINATE = -1.3846E+01 EXPANDED LOAD FUNCTION = -8.66225E-02
 CIRC. STA. 140 CIRCUMFERNENTIAL COORDINATE = -1.2642E+01 EXPANDED LOAD FUNCTION = -8.20222E-02
 CIRC. STA. 141 CIRCUMFERNENTIAL COORDINATE = -1.1438E+01 EXPANDED LOAD FUNCTION = -1.22876E-02
 CIRC. STA. 142 CIRCUMFERNENTIAL COORDINATE = -1.0234E+01 EXPANDED LOAD FUNCTION = 8.61362E-02
 CIRC. STA. 143 CIRCUMFERNENTIAL COORDINATE = -9.0303E+00 EXPANDED LOAD FUNCTION = 1.45068E-02
 CIRC. STA. 144 CIRCUMFERNENTIAL COORDINATE = -7.8263E+00 EXPANDED LOAD FUNCTION = 1.01642E-01
 CIRC. STA. 145 CIRCUMFERNENTIAL COORDINATE = -6.6222E+00 EXPANDED LOAD FUNCTION = -6.11691E-02
 CIRC. STA. 146 CIRCUMFERNENTIAL COORDINATE = -5.4182E+00 EXPANDED LOAD FUNCTION = -2.94638E-01
 CIRC. STA. 147 CIRCUMFERNENTIAL COORDINATE = -4.2142E+00 EXPANDED LOAD FUNCTION = -1.72804E-01
 CIRC. STA. 148 CIRCUMFERNENTIAL COORDINATE = -3.0102E+00 EXPANDED LOAD FUNCTION = -4.99441E-01
 CIRC. STA. 149 CIRCUMFERNENTIAL COORDINATE = -1.8062E+00 EXPANDED LOAD FUNCTION = -5.71220E-01
 CIRC. STA. 150 CIRCUMFERNENTIAL COORDINATE = -6.0217E-01 EXPANDED LOAD FUNCTION = -4.54006E-01
 CIRC. STA. 151 CIRCUMFERNENTIAL COORDINATE = 6.0184E-01 EXPANDED LOAD FUNCTION = -1.72895E-01
 CIRC. STA. 152 CIRCUMFERNENTIAL COORDINATE = 1.8059E+00 EXPANDED LOAD FUNCTION = 4.53499E-01
 CIRC. STA. 153 CIRCUMFERNENTIAL COORDINATE = 3.0099E+00 EXPANDED LOAD FUNCTION = 5.71215E-01
 CIRC. STA. 154 CIRCUMFERNENTIAL COORDINATE = 4.2139E+00 EXPANDED LOAD FUNCTION = 4.99483E-01
 CIRC. STA. 155 CIRCUMFERNENTIAL COORDINATE = 5.4179E+00 EXPANDED LOAD FUNCTION = 2.94703E-01
 CIRC. STA. 156 CIRCUMFERNENTIAL COORDINATE = 6.6219E+00 EXPANDED LOAD FUNCTION = 6.12268E-02
 CIRC. STA. 157 CIRCUMFERNENTIAL COORDINATE = 7.8259E+00 EXPANDED LOAD FUNCTION = -1.01613E-01
 CIRC. STA. 158 CIRCUMFERNENTIAL COORDINATE = 9.0299E+00 EXPANDED LOAD FUNCTION = -1.45073E-01
 CIRC. STA. 159 CIRCUMFERNENTIAL COORDINATE = 1.0234E+01 EXPANDED LOAD FUNCTION = -8.61609E-02
 CIRC. STA. 160 CIRCUMFERNENTIAL COORDINATE = 1.1438E+01 EXPANDED LOAD FUNCTION = 1.22623E-02

Figs 2 & 3
 N & θ

(1)

CIRC. STA. 161 CIRCUMFERNENTIAL COORDINATE = 1.2642E+01 EXPANDED LOAD FUNCTION = 8.20116E-02
 CIRC. STA. 162 CIRCUMFERNENTIAL COORDINATE = 1.3846E+01 EXPANDED LOAD FUNCTION = 8.66301E-02
 CIRC. STA. 163 CIRCUMFERNENTIAL COORDINATE = 1.5050E+01 EXPANDED LOAD FUNCTION = 3.53848E-02
 CIRC. STA. 164 CIRCUMFERNENTIAL COORDINATE = 1.6254E+01 EXPANDED LOAD FUNCTION = -3.03946E-02
 CIRC. STA. 165 CIRCUMFERNENTIAL COORDINATE = 1.7458E+01 EXPANDED LOAD FUNCTION = -6.71483E-02
 CIRC. STA. 166 CIRCUMFERNENTIAL COORDINATE = 1.8662E+01 EXPANDED LOAD FUNCTION = -5.57489E-02
 CIRC. STA. 167 CIRCUMFERNENTIAL COORDINATE = 1.9866E+01 EXPANDED LOAD FUNCTION = -9.78892E-03
 CIRC. STA. 168 CIRCUMFERNENTIAL COORDINATE = 2.1070E+01 EXPANDED LOAD FUNCTION = 3.71064E-02
 CIRC. STA. 169 CIRCUMFERNENTIAL COORDINATE = 2.2274E+01 EXPANDED LOAD FUNCTION = 5.47276E-02
 CIRC. STA. 170 CIRCUMFERNENTIAL COORDINATE = 2.3478E+01 EXPANDED LOAD FUNCTION = 3.4893E-02
 CIRC. STA. 171 CIRCUMFERNENTIAL COORDINATE = 2.4682E+01 EXPANDED LOAD FUNCTION = -5.72667E-03
 CIRC. STA. 172 CIRCUMFERNENTIAL COORDINATE = 2.5886E+01 EXPANDED LOAD FUNCTION = -3.87941E-02

PHYSICAL PROPERTIES OF SEGMENT NO. 2

ANALYSIS IS FOR A MONOCOQUE SHELL MODULUS OF ELASTICITY= 0.10000E+08 POISSON RATIO= 0.30000E+00 SHELL DENSITY = 0.00000E+00 THERMAL EXP COEF. = 0.00000E+00

LINEAR STATIC ANALYSIS FOR NON-SYMMETRIC LOADS

ANALYSIS TYPE = 3, PRINT OPTION = 2, PLOT OPTION = 1, STRESS OPTION = 1, PRESTRESS CALCULATION OPTION= 1
NUMBER OF SHELL SEGMENTS = 2
STRESS CALCULATED FOR CIRCUMFERENTIAL WAVES FROM -40 TO 40 IN INCREMENTS OF 1

SEG. POINT CONNECTED TO SEG. POINT	USTAR VSTAR WSTAR BETA	RADIAL DISC. D1(1)	AXIAL DISC. D2(1)
1 1	1 1 1	0.000000E+00	0.000000E+00
2 1	1 1 1	0.000000E+00	0.000000E+00
1 51	1 1 1	0.000000E+00	0.000000E+00

SEG. POINT CONNECTED TO SEG. POINT	USTAR VSTAR WSTAR BETA	RADIAL DISC. D1(1)	AXIAL DISC. D2(1)
1 1	1 1 1	0.000000E+00	0.000000E+00
2 1	1 1 1	0.000000E+00	0.000000E+00
1 51	1 1 1	0.000000E+00	0.000000E+00

MECHANICAL LINE LOAD MULTIPLIERS FOR NONSYMMETRIC LOADING, LOAD SYSTEM A
AXIAL DISTRIBUTION OF MECHANICAL LINE LOAD MULTIPLIERS FOR ALL CIRCUMFERENTIAL WAVES, LOAD SYSTEM A
STATION AXIAL LOAD SHEAR LOAD RADIAL LOAD
S(K) V(K) SHEAR(K) H(K)
0.9999893E+02 0.00000000E+00 0.11459000E+00 0.00000000E+00
0 99999893E+02 0.00000000E+00 0.00000000E+00 0.26262501E-01

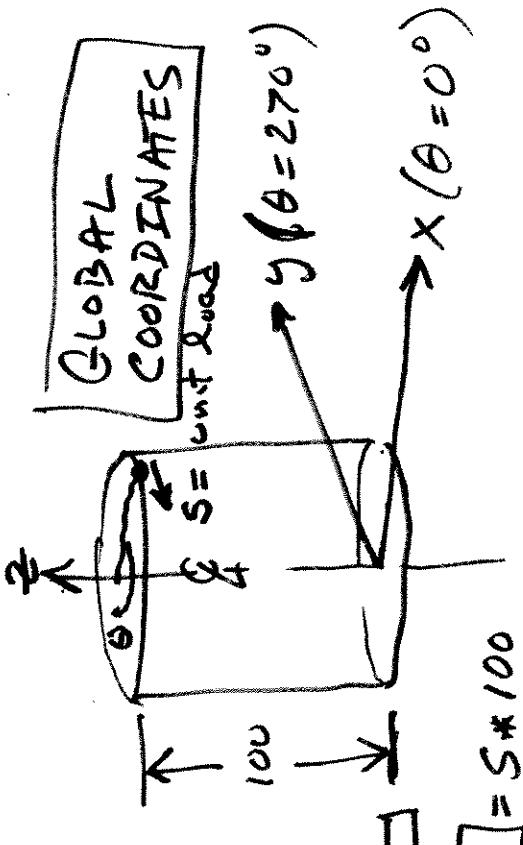
(20)

TOTAL FORCES AND MOMENTS FROM APPLIED LOADS. THE FORCES AND MOMENTS OCCUR AT THE ORIGIN OF THE GLOBAL X,Y,Z AXIS SYSTEM, WHICH IS LOCATED AT AXIAL STATION Z=0. NOTE THAT THE TOTAL FORCES AND MOMENTS ARE NOT APPLIED AT THE C.G. OF THE STRUCTURE, WHICH IS AT AXIAL LOCATION ZCM= 0.0000E+00, BUT THEY ARE APPLIED AT AXIAL STATION Z = 0.

NOTE: IN ORDER FOR THE MASS PROPERTIES AND DYNAMIC REACTIONS TO BE PROPERLY COMPUTED, THE GEOMETRY OF EVERY SEGMENT IN THE ENTIRE STRUCTURE MUST BE EXPRESSED IN TERMS OF THE GLOBAL AXIAL COORDINATE, Z, THAT IS, YOU MUST HAVE PROVIDED AS INPUT FOR EACH SEGMENT THE GLOBAL Z COORDINATES.

TOTAL FORCES FROM LOAD SET A...
X-DIRECTION (THETA= 0 DEG.) , FX(1) = 0.0000E+00
Y-DIRECTION (THETA=270 DEG.) , FY(1) = -1.0093E+00
Z-DIRECTION (AXIAL UPWARD) , FZ(1) = 0.0000E+00

TOTAL MOMENTS FROM LOAD SET A...
ABOUT X-AXIS , MX(1) = 1.0093E+02



ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 11 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 12 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 13 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 14 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 15 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 16 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 17 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 18 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 19 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 20 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 21 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 22 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 23 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 24 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 25 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 26 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 27 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 28 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 29 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 30 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 31 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 32 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 33 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 34 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 35 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 36 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 37 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 38 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 39 WAVES
 ENTER SUBROUTINE ARRAYS TO CALCULATE STIFFNESS MATRIX, LOAD-GEOMETRIC MATRIX, L**2 MATRIX, OR MASS MATRIX. 40 WAVES

***** Beginning of postprocessor calculations *****

***** Beginning of mainprocessor calculations *****

MERIDIONAL DISTRIBUTION OF SUPERPOSED QUANTITIES CORRESPONDING TO CIRCUMFERENTIAL STATION, THETA= 0.0000E+00DEG.

STRESS RESULTANTS OR STRESSES OR STRAINS AND CHANGES IN CURVATURE IN SEGMENT NUMBER 1 1 1 1 *****

***** RESULTS FROM APPLICATION OF LOAD SYSTEM "A" *****

POINT	STATION	U	V	W	S1(IN)	S1(OUT)	TAU(IN)	S2(IN)	S2(OUT)	TAU(OUT)	SYAN(IN)	SYAN(OUT)
(ARC LENGTH)	MERID.	CIRCUMF.	NORMAL	MERID.	MER.D.	IN-PLANE	CIRCUMF.	IN-PLANE	CIRCUMF.	IN-PLANE	EFFECTIVE STRESS	VON MISES
3.3	8.73E+01	-4.13E-08	1.29E-06	2.08E-07	2.12E-02	-4.53E-02	8.78E-02	-1.23E-02	-2.69E-02	-3.89E-02	1.55E-01	7.82E-02
3.4	8.80E+01	-4.17E-08	1.31E-06	2.20E-07	2.79E-02	-5.20E-02	9.17E-02	-1.16E-02	-2.94E-02	-4.13E-02	1.63E-01	8.45E-02
3.5	8.87E+01	-4.21E-08	1.33E-06	2.36E-07	3.55E-02	-5.96E-02	9.58E-02	-1.06E-02	-3.19E-02	-4.38E-02	1.71E-01	9.17E-02
3.6	8.93E+01	-4.25E-08	1.35E-06	2.55E-07	4.41E-02	-6.81E-02	1.00E-01	-9.25E-03	-3.44E-02	-4.64E-02	1.81E-01	9.97E-02
3.7	9.00E+01	-4.29E-08	1.37E-06	2.80E-07	5.39E-02	-7.76E-02	1.05E-01	-7.52E-03	-3.67E-02	-4.93E-02	1.91E-01	1.09E-01
3.8	9.07E+01	-4.32E-08	1.39E-06	3.09E-07	6.49E-02	-8.82E-02	1.10E-01	-5.37E-03	-3.88E-02	-5.24E-02	2.03E-01	1.19E-01
3.9	9.13E+01	-4.35E-08	1.41E-06	3.45E-07	7.73E-02	-1.00E-01	1.16E-01	-2.75E-03	-4.07E-02	-5.57E-02	2.16E-01	1.30E-01
4.0	9.20E+01	-4.39E-08	1.43E-06	3.89E-07	9.13E-02	-1.13E-01	1.22E-01	3.92E-04	-4.20E-02	-5.92E-02	2.31E-01	1.43E-01
4.1	9.27E+01	-4.42E-08	1.45E-06	4.41E-07	1.07E-01	-1.28E-01	1.29E-01	4.10E-03	-4.28E-02	-6.29E-02	2.47E-01	1.57E-01
4.2	9.33E+01	-4.45E-08	1.48E-06	5.03E-07	1.24E-01	-1.45E-01	1.36E-01	8.41E-03	-4.29E-02	-6.68E-02	2.65E-01	1.73E-01
4.3	9.40E+01	-4.49E-08	1.50E-06	5.76E-07	1.44E-01	-1.63E-01	1.44E-01	1.34E-02	-4.19E-02	-7.09E-02	2.85E-01	1.91E-01
4.4	9.47E+01	-4.52E-08	1.52E-06	6.62E-07	1.66E-01	-1.84E-01	1.53E-01	1.90E-02	-3.97E-02	-7.50E-02	3.08E-01	2.12E-01
4.5	9.53E+01	-4.56E-08	1.55E-06	7.62E-07	1.91E-01	-2.07E-01	1.62E-01	2.53E-02	-3.59E-02	-7.91E-02	3.35E-01	2.35E-01
4.6	9.60E+01	-4.61E-08	1.57E-06	8.80E-07	2.18E-01	-2.33E-01	1.72E-01	3.23E-02	-3.01E-02	-8.32E-02	3.61E-01	2.62E-01
4.7	9.67E+01	-4.67E-08	1.60E-06	1.02E-06	2.49E-01	-2.62E-01	1.82E-01	4.01E-02	-2.17E-02	-8.68E-02	3.92E-01	2.93E-01
4.8	9.73E+01	-4.73E-08	1.62E-06	1.18E-06	2.84E-01	-2.95E-01	1.94E-01	4.84E-02	-1.01E-02	-8.99E-02	4.27E-01	3.29E-01

4.9	9.80E+01	-4.81E-08	1.65E-06	1.36E-06	3.24E-01	-3.32E-01	2.06E-01	5.74E-02	5.40E-03	-9.21E-02	4.66E-01	3.71E-01
5.0	9.87E+01	-4.91E-08	1.68E-06	1.57E-06	3.69E-01	-3.75E-01	2.19E-01	6.69E-02	2.59E-02	-9.28E-02	5.10E-01	4.20E-01
5.1	9.93E+01	-5.04E-08	1.71E-06	1.81E-06	4.20E-01	-4.23E-01	2.33E-01	7.66E-02	5.23E-02	-9.14E-02	5.59E-01	4.78E-01
5.2	9.98E+01	-5.15E-08	1.73E-06	2.02E-06	4.63E-01	-4.65E-01	2.43E-01	8.42E-02	7.66E-02	-8.83E-02	6.05E-01	5.30E-01
5.3	1.00E+02	-5.19E-08	1.74E-06	2.10E-06	4.76E-01	-4.77E-01	2.46E-01	8.55E-02	8.83E-02	-8.68E-02	6.12E-01	5.39E-01

STRESS RESULTANTS OR STRESSES OR STRAINS AND
CHANGES IN CURVATURE IN SEGMENT NUMBER 2

↳ longest stresses.

POINT	STATION (ARC LENGTH)	U	V	W	S1(IN) MERID.	CIRCUMF. DISP.	NORMAL DISPLACEMENT	S1(OUT) MERID.	TAU(IN) IN-PLANE	S2(IN) CIRCUMF.	S2(OUT) CIRCUMF.	TAU(OUT) IN-PLANE	S1(OUT) MERID.	S2(OUT) VON MISES STRESS	
1	1.00E+02	-5.21E-08	1.74E-06	2.10E-06	-8.48E-02	8.33E-02	1	5.4E-01	-8.27E-02	2.57E-01	-1.81E-01	2.79E-01	3.87E-01	2.79E-01	3.87E-01
2	1.00E+02	-5.21E-08	1.74E-06	2.13E-06	-7.97E-02	7.83E-02	1	5.5E-01	-8.21E-02	2.61E-01	-1.81E-01	2.81E-01	3.89E-01	2.81E-01	3.89E-01
3	1.00E+02	-5.27E-08	1.74E-06	2.21E-06	-6.21E-02	6.12E-02	1	5.9E-01	-7.92E-02	2.72E-01	-1.79E-01	2.86E-01	3.97E-01	2.86E-01	3.97E-01
4	1.00E+02	-5.34E-08	1.75E-06	2.32E-06	-4.05E-02	4.00E-02	1	6.6E-01	-7.58E-02	2.87E-01	-1.76E-01	2.95E-01	4.10E-01	2.95E-01	4.10E-01
5	1.01E+02	-5.42E-08	1.76E-06	2.44E-06	-1.99E-02	1.98E-02	1	7.3E-01	-7.25E-02	3.02E-01	-1.73E-01	3.07E-01	4.26E-01	3.07E-01	4.26E-01
6	1.01E+02	-5.49E-08	1.76E-06	2.52E-06	-5.23E-03	5.20E-03	1	7.9E-01	-7.02E-02	3.14E-01	-1.70E-01	3.17E-01	4.40E-01	3.17E-01	4.40E-01
7	1.01E+02	-5.51E-08	1.76E-06	2.55E-06	-4.85E-04	4.83E-04	1	8.1E-01	-6.95E-02	3.19E-01	-1.80E-01	3.21E-01	4.46E-01	3.21E-01	4.46E-01

CIRCUMFERENTIAL VARIATION OF SUPERPOSED QUANTITIES AT POINT NO. ***** RESULTS FROM APPLICATION OF LOAD SYSTEM "A" *****

POINT	STATION	U (ARC LENGTH)	V	W	S1(IN) MERID.	S1(OUT) MERID.	TAU(IN) IN-PLANE	S2(IN) CIRCUMF.	TAU(OUT) IN-PLANE	S3(OUT) VON MISES
1	0.00E+00	-5.19E-08	1.74E-06	2.10E-06	4.76E-01	-4.77E-01	2.46E-01	8.55E-02	8.83E-02	8.68E-02
2	4.00E+00	-2.03E-07	1.46E-06	6.10E-06	1.23E-01	-1.21E-01	-8.06E-02	-2.99E-01	3.27E-01	1.34E-01
3	8.00E+00	-2.74E-07	1.01E-06	7.08E-06	-8.54E-03	7.30E-03	-8.73E-02	-6.67E-02	1.60E-01	7.91E-02
4	1.20E+01	-2.93E-07	5.56E-07	6.70E-06	1.99E-02	-1.97E-02	-4.61E-02	-4.22E-02	1.17E-01	4.72E-02
5	1.60E+01	-2.76E-07	1.47E-07	5.52E-06	-1.01E-02	1.01E-02	-4.37E-02	-1.40E-03	5.66E-02	3.54E-02
6	2.00E+01	-2.36E-07	-1.69E-07	4.01E-06	1.41E-02	-1.41E-02	-1.75E-02	1.75E-02	-1.88E-02	1.77E-02
7	2.40E+01	-1.85E-07	-3.86E-07	2.44E-06	-8.16E-03	8.40E-03	-2.30E-02	2.08E-02	-4.15E-03	1.83E-02
8	2.80E+01	-1.31E-07	-4.99E-07	1.00E-06	9.54E-03	-9.70E-03	-3.56E-03	4.17E-02	-2.96E-02	4.17E-02
9	3.20E+01	-7.99E-08	-5.26E-07	-1.41E-07	-4.77E-03	5.04E-03	-1.04E-02	2.69E-02	-2.78E-02	3.84E-02
10	3.60E+01	-3.56E-08	-4.85E-07	-9.83E-07	4.72E-03	-4.92E-03	2.40E-03	8.48E-03	3.46E-02	3.39E-02
11	4.00E+01	-1.48E-09	-3.98E-07	-1.46E-06	-1.09E-03	1.35E-03	-2.08E-03	4.34E-02	-4.11E-02	2.31E-03
12	4.40E+01	2.29E-08	-2.89E-07	-1.66E-06	3.39E-04	-1.98E-04	3.90E-03	2.09E-02	-2.69E-02	2.02E-03
13	4.80E+01	3.68E-08	-1.76E-07	-1.58E-06	1.91E-03	-1.91E-03	2.97E-03	9.63E-03	-1.51E-02	1.98E-03

CONVERGENCE CHECKS (Two runs, the first for high negative harmonics, the second for high positive harmonics.

Stresses for circumferential harmonics from -120 to -41:

MERIDIONAL DISTRIBUTION OF SUPERPOSED QUANTITIES CORRESPONDING TO CIRCUMFERENTIAL STATION, $\Theta = 0.0000E+00$ DEG

STRESS RESULTANTS OR STRESSES OR STRAINS AND
CHANGES IN CURVATURE IN SEGMENT NUMBER 1
*****RESULTS FROM APPLICATION OF LOADS ON

	DISP.	DISPLACEMENT	DISP.	STRESS	STRESS	SHEAR	STRESS	STRESS	SHEAR	EFFECTIVE STRESS
33	8.73E+01	-5.65E-14	0.00E+00	-1.77E-10	-5.72E-05	4.65E-05	0.00E+00	1.72E-04	-1.53E-04	2.07E-04
34	8.80E+01	-7.40E-13	0.00E+00	-2.23E-10	-6.78E-05	5.07E-05	0.00E+00	2.20E-04	-1.95E-04	2.60E-04
35	8.87E+01	-1.73E-12	0.00E+00	-2.79E-10	-7.85E-05	5.29E-05	0.00E+00	2.79E-04	-2.49E-04	3.26E-04
36	8.93E+01	-3.11E-12	0.00E+00	-3.48E-10	-8.80E-05	5.11E-05	0.00E+00	3.54E-04	-3.17E-04	4.06E-04
37	9.00E+01	-4.99E-12	0.00E+00	-4.32E-10	-9.37E-05	4.21E-05	0.00E+00	4.48E-04	-4.04E-04	4.48E-04
38	9.07E+01	-7.50E-12	0.00E+00	-5.34E-10	-9.15E-05	2.13E-05	0.00E+00	5.65E-04	-5.14E-04	6.16E-04
39	9.13E+01	-1.08E-11	0.00E+00	-6.55E-10	-7.49E-05	-1.86E-05	0.00E+00	7.10E-04	-6.52E-04	7.50E-04
40	9.20E+01	-1.50E-11	0.00E+00	-7.97E-10	-3.34E-05	-8.88E-05	0.00E+00	8.87E-04	-8.25E-04	9.05E-04
41	9.27E+01	-2.03E-11	0.00E+00	-9.59E-10	-4.96E-05	-2.86E-04	0.00E+00	1.10E-03	-1.04E-03	9.54E-04
42	9.33E+01	-2.68E-11	0.00E+00	-1.14E-09	1.99E-04	-3.97E-04	0.00E+00	1.37E-03	-1.31E-03	1.16E-03
43	9.40E+01	-3.46E-11	0.00E+00	-1.33E-09	4.55E-04	-6.59E-04	0.00E+00	1.68E-03	-1.64E-03	1.51E-03
44	9.47E+01	-4.39E-11	0.00E+00	-1.51E-09	8.78E-04	-1.17E-03	0.00E+00	2.06E-03	-2.04E-03	1.77E-03
45	9.53E+01	-5.46E-11	0.00E+00	-1.65E-09	1.56E-03	-1.91E-03	0.00E+00	2.50E-03	-2.52E-03	2.19E-03
46	9.60E+01	-6.65E-11	0.00E+00	-1.71E-09	2.65E-03	-3.05E-03	0.00E+00	3.01E-03	-3.09E-03	3.07E-03
47	9.67E+01	-7.92E-11	0.00E+00	-1.60E-09	4.39E-03	-4.83E-03	0.00E+00	3.57E-03	-3.74E-03	4.38E-03
48	9.73E+01	-9.23E-11	0.00E+00	-1.17E-09	7.16E-03	-7.63E-03	0.00E+00	4.18E-03	-4.44E-03	6.23E-03
49	9.80E+01	-1.05E-10	0.00E+00	-2.04E-10	1.17E-02	-1.21E-02	0.00E+00	4.75E-03	-5.10E-03	6.64E-03
50	9.87E+01	-1.16E-10	0.00E+00	1.69E-09	1.92E-02	-1.56E-02	0.00E+00	5.13E-03	-5.53E-03	1.02E-02
51	9.93E+01	-1.26E-10	0.00E+00	5.11E-09	3.20E-02	-3.24E-02	0.00E+00	4.92E-03	-5.24E-03	1.72E-02
52	9.98E+01	-1.32E-10	0.00E+00	9.27E-09	4.82E-02	-4.84E-02	0.00E+00	3.98E-03	-4.02E-03	3.01E-02
53	1.00E+02	-1.34E-10	0.00E+00	1.14E-08	5.31E-02	-5.35E-02	0.00E+00	2.08E-03	-1.92E-03	4.65E-02

STRESS RESULTANTS OR STRESSES OR STRAINS AND
CHANGES IN CURVATURE IN SEGMENT NUMBER 2

***** RESULTS FROM APPLICATION OF LOAD SYSTEM "A" *****

POINT	STATION	U	V	W	S1(IN) MERID. CIRCUMF. NORMAL	S1(OUT) MERID. CIRCUMF. NORMAL	TAU(IN) IN-PLANE SHEAR	S2(IN) CIRCUMF. STRESS	S2(OUT) CIRCUMF. STRESS	TAU(OUT) IN-PLANE SHEAR	SVON(IN) VON MISES	SVON(OUT) VON MISES
1	1.00E+02	-1.34E-10	0.00E+00	1.14E-08	-3.26E-02	3.24E-02	0.00E+00	-2.36E-02	2.38E-02	0.00E+00	2.91E-02	2.90E-02
2	1.00E+02	-1.35E-10	0.00E+00	1.23E-08	-3.04E-02	3.02E-02	0.00E+00	-2.43E-02	2.46E-02	0.00E+00	2.79E-02	2.79E-02
3	1.00E+02	-1.37E-10	0.00E+00	1.44E-08	-2.26E-02	2.25E-02	0.00E+00	-2.54E-02	2.58E-02	0.00E+00	2.41E-02	2.43E-02
4	1.00E+02	-1.41E-10	0.00E+00	1.72E-08	-1.41E-02	1.40E-02	0.00E+00	-2.69E-02	2.76E-02	0.00E+00	2.33E-02	2.39E-02
5	1.01E+02	-1.44E-10	0.00E+00	1.99E-08	-6.65E-03	6.62E-03	0.00E+00	-2.85E-02	2.94E-02	0.00E+00	2.58E-02	2.67E-02
6	1.01E+02	-1.47E-10	0.00E+00	2.19E-08	-1.67E-03	1.66E-03	0.00E+00	-2.98E-02	3.10E-02	0.00E+00	2.90E-02	3.02E-02
7	1.01E+02	-1.48E-10	0.00E+00	2.27E-08	-1.60E-04	1.59E-04	0.00E+00	-3.05E-02	3.17E-02	0.00E+00	3.04E-02	3.16E-02

CIRCUMFERENTIAL VARIATION OF SUPERPOSED QUANTITIES AT POINT NO. 53, SEGMENT NO. 1, MERIDIONAL STATION= 1.000E+02

***** RESULTS FROM APPLICATION OF LOAD SYSTEM "A" *****

POINT	STATION	U	V	W	S1(IN) MERID. CIRCUMF. NORMAL	S1(OUT) MERID. CIRCUMF. NORMAL	TAU(IN) IN-PLANE SHEAR	S2(IN) CIRCUMF. STRESS	S2(OUT) CIRCUMF. STRESS	TAU(OUT) IN-PLANE SHEAR	SVON(IN) VON MISES	SVON(OUT) VON MISES
1	0.00E+00	-1.34E-10	0.00E+00	1.14E-08	5.31E-02	-5.33E-02	0.00E+00	2.08E-03	-1.92E-03	0.00E+00	5.21E-02	5.24E-02
2	4.00E+02	-1.15E-10	9.70E-12	-1.00E-08	-2.65E-02	2.67E-02	-3.73E-04	1.54E-03	-1.72E-03	4.00E-04	2.73E-02	2.76E-02
3	8.00E+02	-1.02E-10	-1.14E-11	8.77E-09	2.57E-02	-2.58E-02	-5.80E-03	-9.26E-04	1.08E-03	5.72E-03	2.80E-02	2.82E-02
4	1.20E+02	8.00E-11	-2.43E-12	-6.89E-09	-1.88E-02	1.89E-02	3.02E-03	5.67E-04	-7.06E-04	-2.98E-03	1.98E-02	2.00E-02
5	1.60E+01	-6.35E-11	2.17E-11	5.45E-09	1.53E-02	-1.53E-02	-4.13E-04	-9.96E-04	4.09E-04	4.25E-04	1.56E-02	1.56E-02
6	2.00E+01	4.94E-11	-3.82E-11	-4.24E-09	-1.19E-02	1.20E-02	-1.53E-03	2.23E-04	-3.10E-04	1.48E-03	1.23E-02	1.24E-02
7	2.40E+01	-3.64E-11	5.00E-11	3.13E-09	8.54E-03	-8.58E-03	2.73E-03	-2.48E-04	3.12E-04	-2.65E-03	9.88E-03	9.87E-03
8	2.80E+01	2.42E-11	-5.67E-11	-2.09E-09	-5.47E-03	5.50E-03	-3.26E-03	2.54E-04	-2.95E-04	3.17E-03	7.96E-03	7.87E-03
9	3.20E+01	-1.31E-11	5.86E-11	1.14E-09	3.04E-03	-3.06E-03	3.35E-03	-1.74E-04	1.94E-04	-3.25E-03	6.59E-03	6.45E-03
10	3.60E+01	3.15E-12	-5.62E-11	-2.87E-10	-1.21E-03	1.21E-03	-3.22E-03	2.93E-05	-3.07E-05	3.12E-03	5.71E-03	5.55E-03
11	4.00E+01	5.27E-12	5.01E-11	-4.36E-10	-3.19E-04	3.21E-04	3.00E-03	1.05E-04	-1.19E-04	-2.91E-03	5.21E-03	5.06E-03
12	4.40E+01	-1.20E-11	-4.12E-11	1.01E-09	1.77E-03	-1.78E-03	-2.66E-03	-1.67E-04	1.93E-04	-2.91E-03	4.96E-03	4.85E-03

(2)

CONTINUING CONVERGENCE CHECK (High positive harmonics)
Stresses for circumferential harmonics from 41 to 120:

MERIDIONAL DISTRIBUTION OF SUPERPOSED QUANTITIES CORRESPONDING TO CIRCUMFERENTIAL STATION. THETA= 0.0000E+00DEG.

POINT	STATION	(ARC LENGTH)	U	V	W	S1(OUT)	TAU(OUT)	S2(OUT)	TAU(OUT)	SVON(OUT)
			MERID.	CIRCUMF.	NORMAL	DISPLACEMENT	DISP.	IN-PLANE	VON MISES	EFFECTIVE STRESS
33	8.73E+01	0.00E+00	-1.30E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.65E-04	8.06E-04
34	8.80E+01	0.00E+00	-1.44E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.94E-04	1.03E-03
35	8.87E+01	0.00E+00	-1.55E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-7.56E-04	1.31E-03
36	9.93E+01	0.00E+00	-1.62E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-9.61E-04	1.66E-03
37	9.00E+01	0.00E+00	-1.60E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.04E-03	1.66E-03
38	9.07E+01	0.00E+00	-1.45E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.22E-03	2.11E-03
39	9.13E+01	0.00E+00	-1.09E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.54E-03	2.67E-03
40	9.20E+01	0.00E+00	-4.04E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.94E-03	3.37E-03
41	9.27E+01	0.00E+00	7.63E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.44E-03	3.03E-03
42	9.33E+01	0.00E+00	2.64E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.06E-03	4.23E-03
43	9.40E+01	0.00E+00	5.55E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.91E-03	5.30E-03
44	9.47E+01	0.00E+00	9.97E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.03E-03	6.59E-03
45	9.53E+01	0.00E+00	1.66E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-6.43E-03	8.15E-03
46	9.60E+01	0.00E+00	2.64E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-8.15E-03	9.99E-03
47	9.67E+01	0.00E+00	4.10E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.02E-02	1.21E-02
48	9.73E+01	0.00E+00	6.29E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.27E-02	1.44E-02
49	9.80E+01	0.00E+00	9.58E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.56E-02	1.69E-02
50	9.87E+01	0.00E+00	1.47E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.11E-02	1.89E-02
51	9.93E+01	0.00E+00	2.26E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.27E-02	2.08E-02
52	9.98E+01	0.00E+00	3.10E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.69E-02	2.10E-02
53	1.00E+02	0.00E+00	3.49E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.83E-02	3.21E-02

STRESS RESULTANTS OR STRESSES OR STRAINS AND CHANGES IN CURVATURE IN SEGMENT NUMBER 2 *** RESULTS FROM APPLICATION OF LOADS**

POINT	STATION	U (ARC LENGTH)	V	W	S1(OUT) MERID.	S1(IN) MERID.	TAU(IN) IN-PLANE	S2(OUT) CIRCUMF.	TAU(OUT) IN-PLANE	S3(OUT) VON MISES
1	1.00E+02	0.00E+00	3.49E-09	0.00E+00	0.00E+00	0.00E+00	8.42E-03	0.00E+00	-2.09E-02	1.46E-02
2	1.00E+02	0.00E+00	3.40E-09	0.00E+00	0.00E+00	0.00E+00	8.96E-03	0.00E+00	-2.04E-02	1.55E-02
3	1.00E+02	0.00E+00	3.22E-09	0.00E+00	0.00E+00	0.00E+00	1.05E-02	0.00E+00	-1.91E-02	1.82E-02
4	1.00E+02	0.00E+00	3.04E-09	0.00E+00	0.00E+00	0.00E+00	1.25E-02	0.00E+00	-1.79E-02	1.71E-02
5	1.01E+02	0.00E+00	2.95E-09	0.00E+00	0.00E+00	0.00E+00	1.46E-02	0.00E+00	-1.73E-02	1.72E-02
6	1.01E+02	0.00E+00	2.92E-09	0.00E+00	0.00E+00	0.00E+00	1.63E-02	0.00E+00	-1.69E-02	1.69E-02
7	1.01E+02	0.00E+00	2.92E-09	0.00E+00	0.00E+00	0.00E+00	1.69E-02	0.00E+00	-1.69E-02	1.69E-02

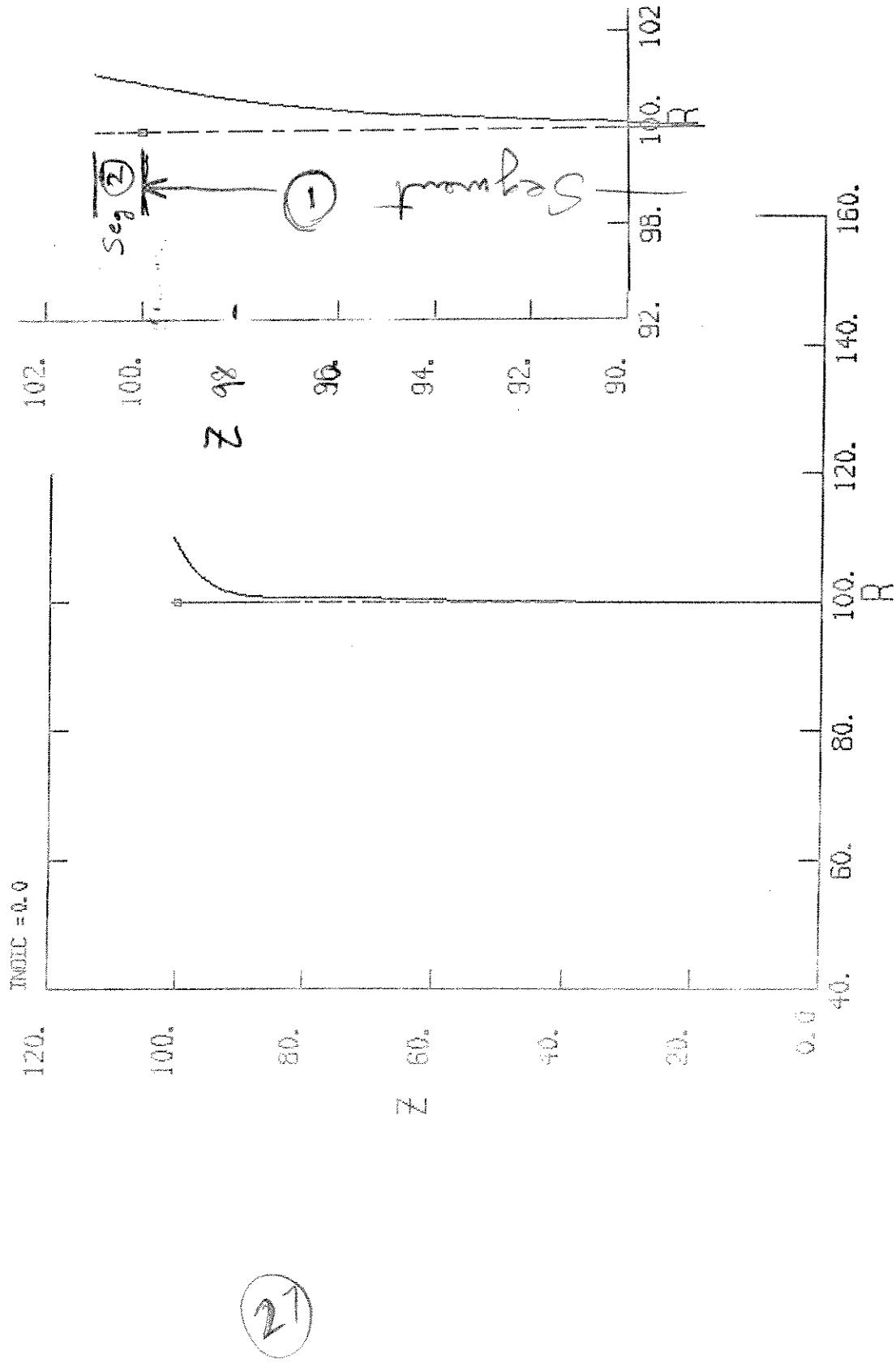
***** CIRCUMFERENTIAL VARIATION OF SUPERPOSED QUANTITIES AT POINT NO. 1

CIRCUMFERENTIAL VARIATION OF SUPERPOSED QUANTITIES AT POINT NO. 53, SEGMENT NO. 1, MERIDIONAL STATION= 1000E1.23

(ARC LENGTH)	MERID.	CIRCUMF.	NORMAL	MERID.	CIRCUMF.	IN-PLANE	CIRCUMF.	IN-PLANE	CIRCUMF.	IN-PLANE	VON MISES
	DISP.	DISPLACEMENT	DISP.	STRESS	STRESS	STRESS	STRESS	SHEAR	STRESS	SHEAR	EFFECTIVE STRESS
1	0. 00E+00	0. 00E+00	3. 49E-09	0. 00E+00	0. 00E+00	0. 00E+00	2. 25E-02	0. 00E+00	0. 00E+00	-6. 58E-03	3. 89E-02
2	4. 00E+00	7. 33E-11	-2. 62E-09	-6. 71E-09	8. 41E-03	-7. 83E-03	-1. 91E-02	1. 53E-02	-1. 63E-02	1. 14E-02	3. 56E-02
3	8. 00E+00	-7. 11E-11	2. 27E-09	8. 05E-09	-7. 29E-03	8. 28E-03	1. 31E-02	-1. 99E-02	1. 36E-02	-5. 64E-03	2. 86E-02
4	1. 20E+01	2. 44E-11	-1. 72E-09	-3. 37E-09	3. 28E-03	-3. 77E-03	-9. 50E-03	9. 41E-03	-6. 14E-03	3. 99E-03	1. 84E-02
5	1. 60E+01	3. 89E-11	1. 36E-09	-9. 19E-09	-1. 05E-03	1. 20E-03	7. 57E-03	-2. 15E-03	1. 63E-03	-3. 07E-03	1. 33E-02
6	2. 00E+01	-9. 13E-11	-1. 06E-09	4. 18E-09	-5. 83E-04	4. 73E-04	-5. 97E-03	-2. 86E-03	1. 34E-03	2. 45E-03	1. 07E-02
7	2. 40E+01	1. 29E-10	7. 82E-10	-6. 45E-09	1. 39E-03	-1. 60E-03	4. 46E-03	6. 21E-03	-3. 46E-03	-1. 95E-03	9. 56E-03
8	2. 80E+01	-1. 52E-10	-5. 21E-10	7. 82E-09	-2. 09E-03	2. 32E-03	-3. 04E-03	-8. 22E-03	4. 96E-03	1. 45E-03	9. 08E-03
9	3. 20E+01	1. 60E-10	2. 90E-10	-8. 37E-09	2. 50E-03	-2. 70E-03	1. 77E-03	9. 12E-03	-5. 82E-03	-8. 97E-04	8. 72E-03
10	3. 60E+01	-1. 56E-10	-9. 06E-11	8. 20E-09	-2. 59E-03	2. 76E-03	-6. 79E-04	-9. 13E-03	5. 98E-03	3. 31E-04	8. 23E-03
11	4. 00E+01	1. 40E-10	-7. 87E-11	-7. 43E-09	2. 39E-03	-2. 57E-03	-2. 54E-04	8. 14E-03	-5. 49E-03	1. 66E-04	7. 54E-03
12	4. 40E+01	-1. 16E-10	2. 19E-10	6. 19E-09	-1. 99E-03	2. 18E-03	1. 04E-03	-7. 19E-03	4. 54E-03	-5. 28E-04	6. 67E-03

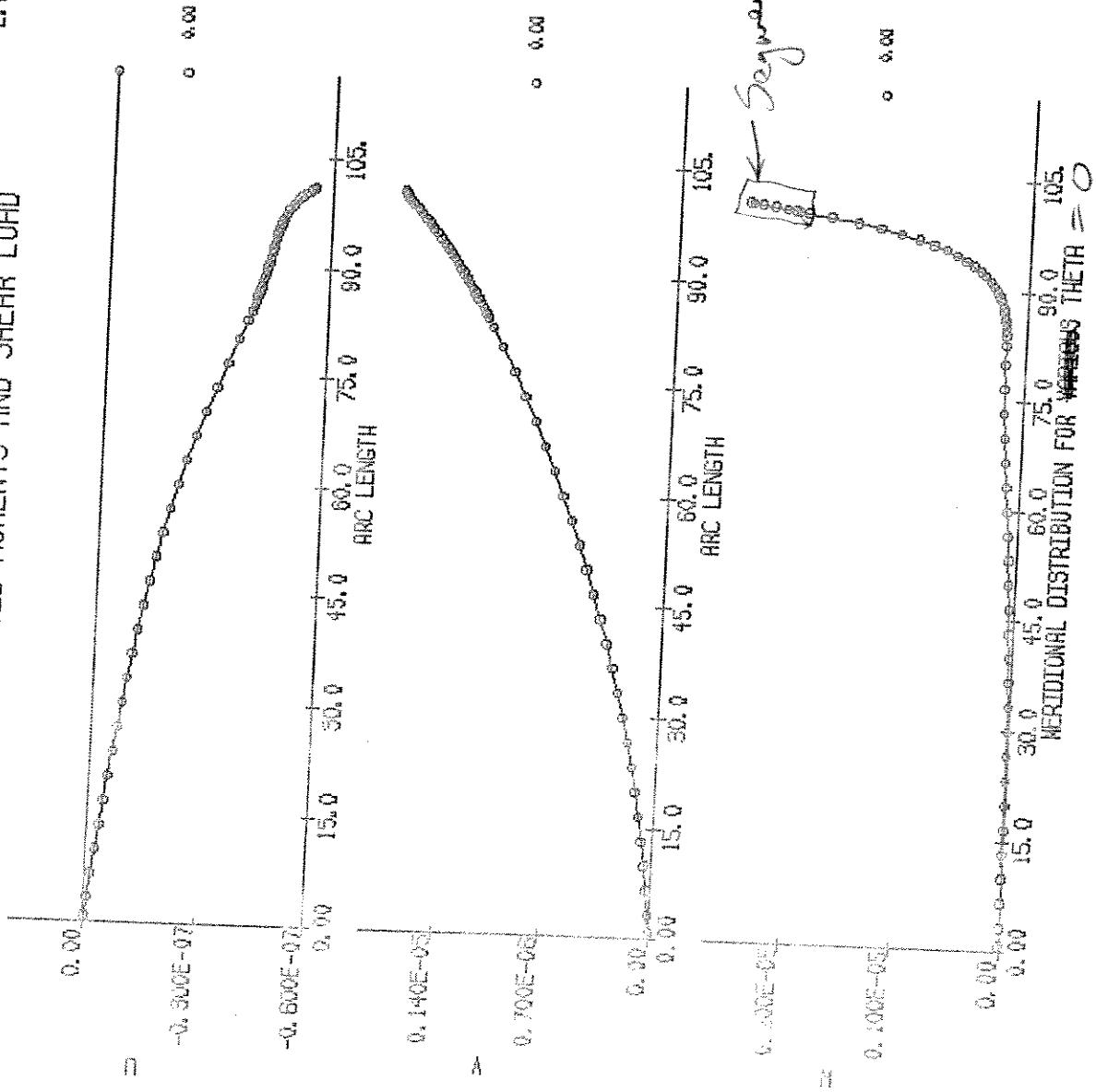
END OF CONVERGENCE STUDY
END OF CASE.

BUSOR4 CONCENTRATED MOMENTS AND SHEAR LOAD
DEFORMED STRUCTURE
MERIDIONAL DISTRIBUTION FOR THETA = 0.00



BOSOR4 CONCENTRATED MOMENTS AND SHEAR LOAD

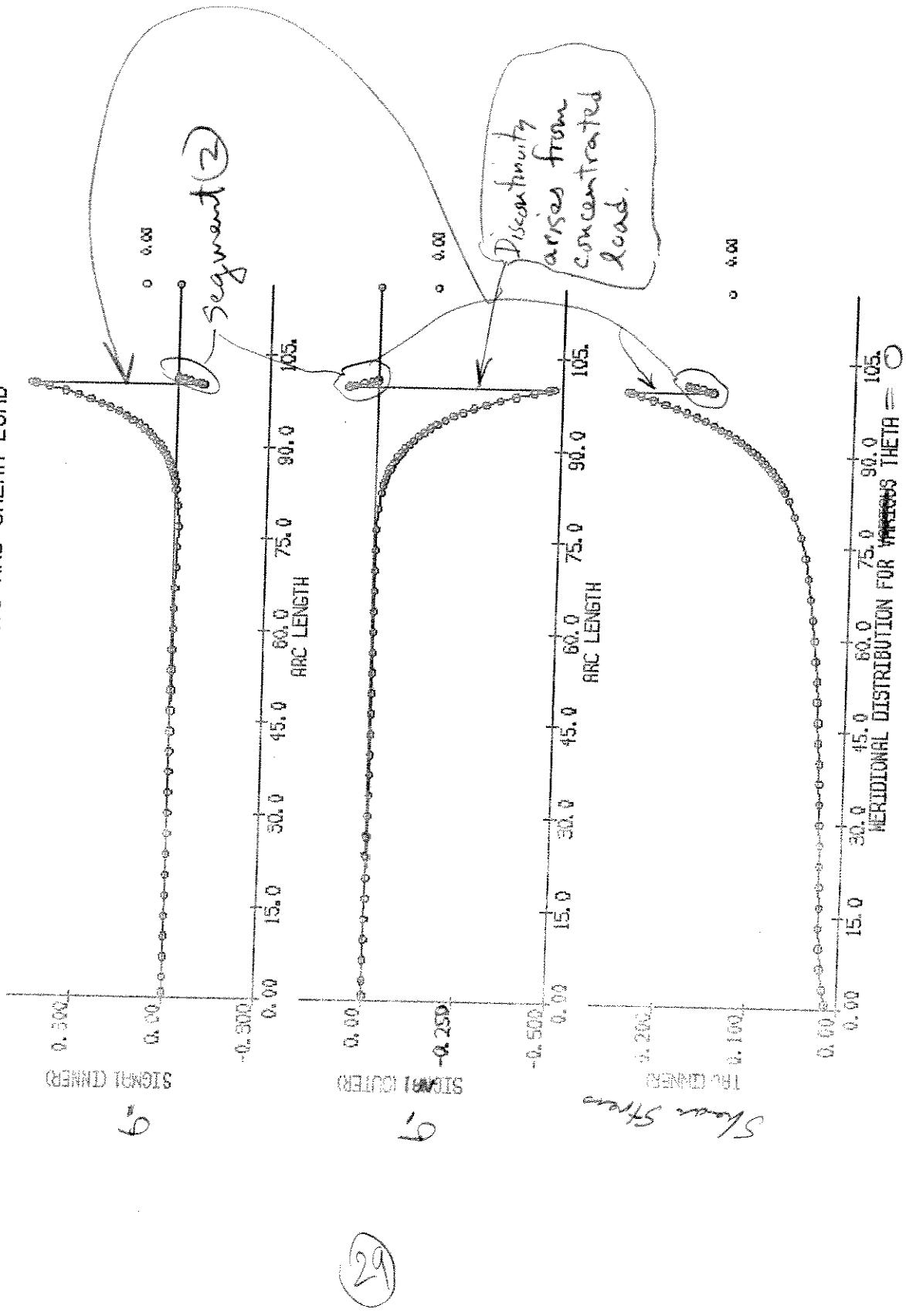
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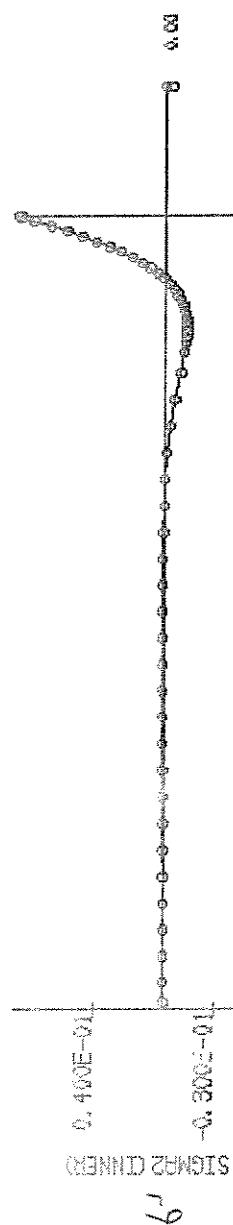
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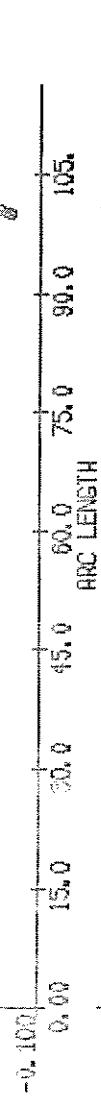


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6.1

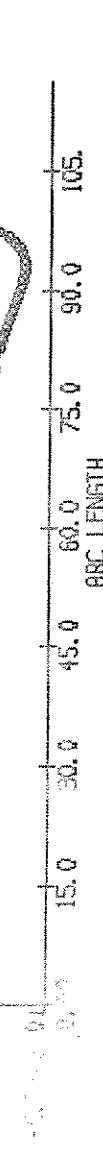


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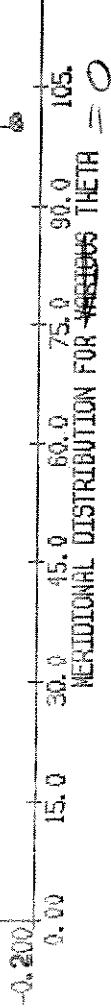


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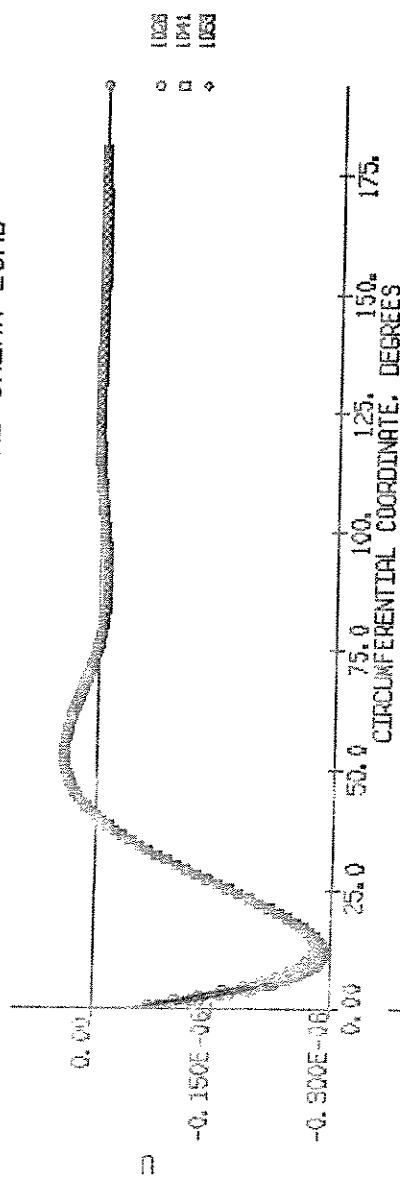
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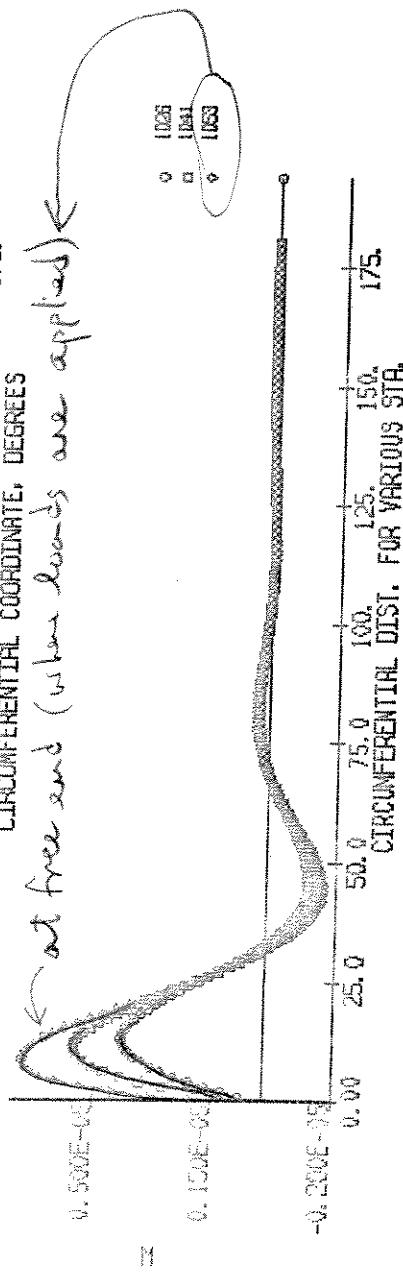
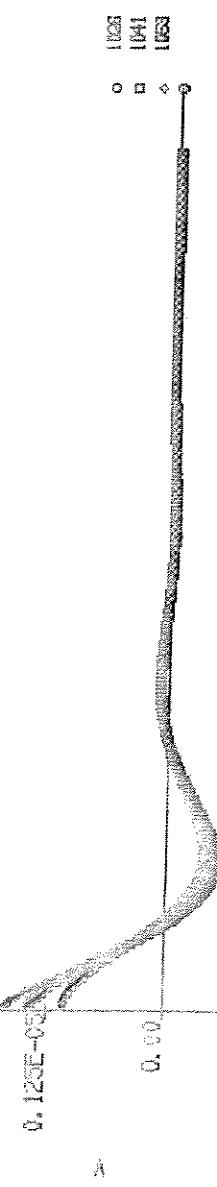
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8.1



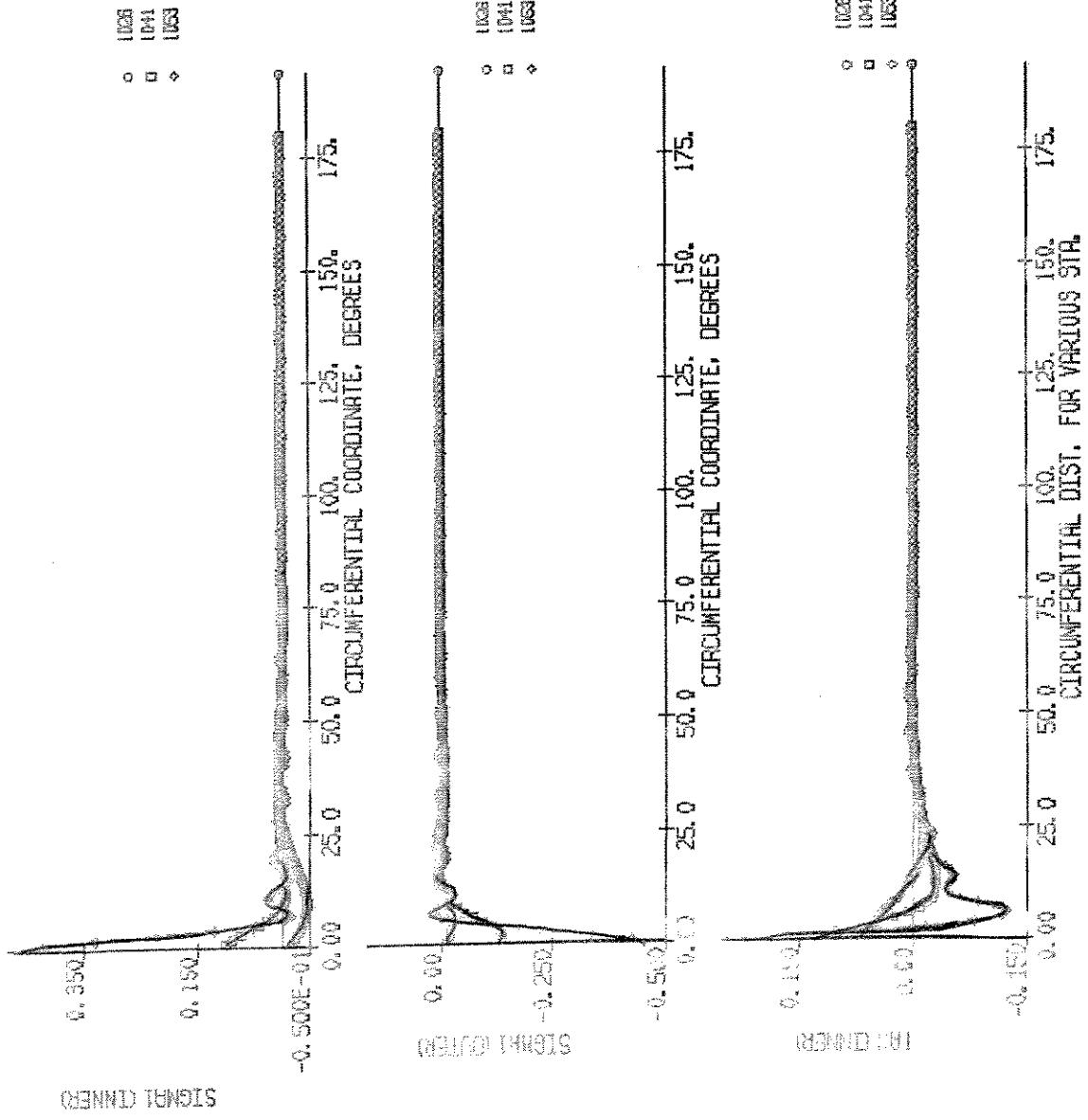
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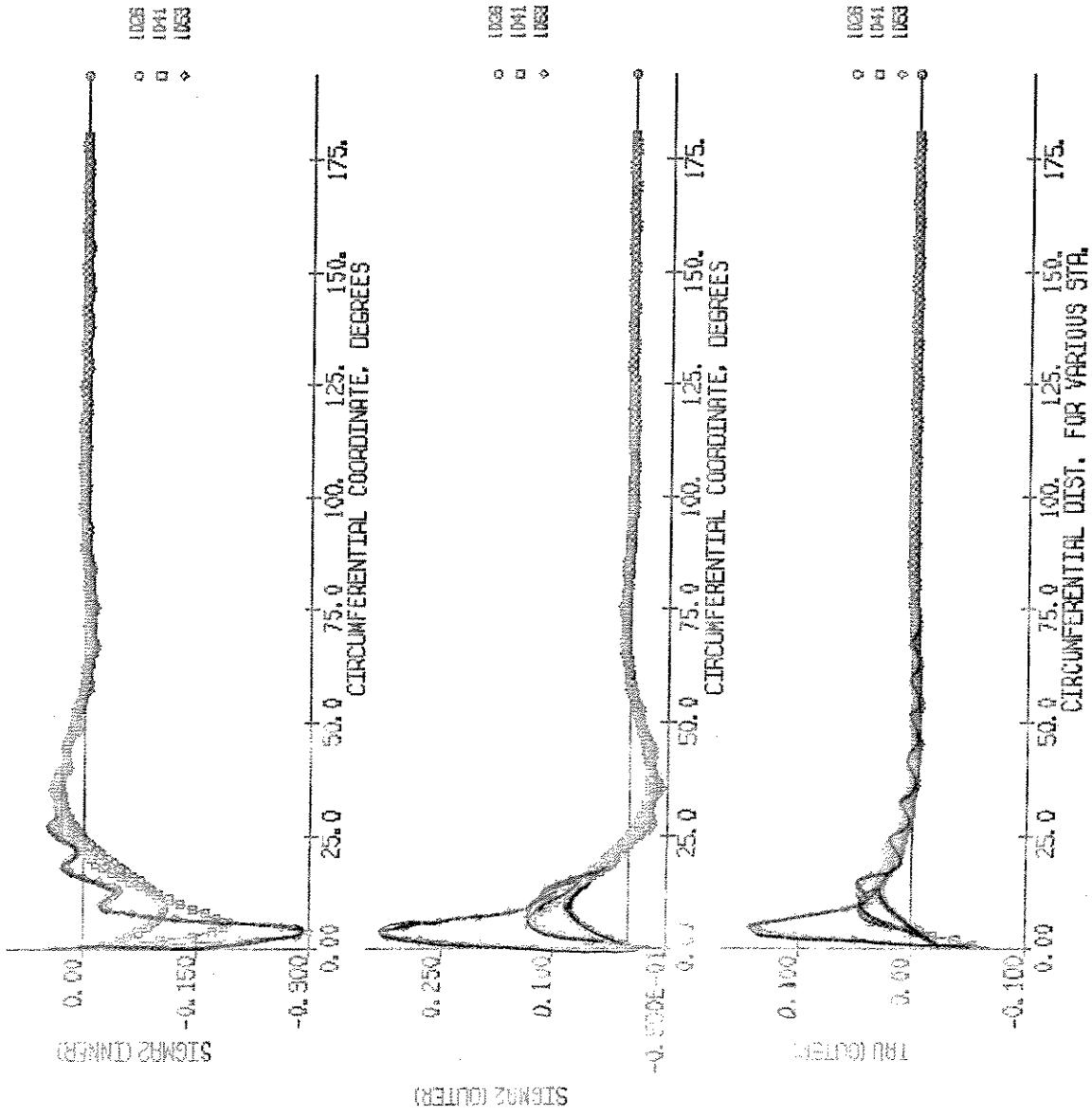
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BOSOR4B

BOSOR4 CONCENTRATED MOMENTS AND SHEAR LOAD

12.



(33)

BOSOR4B