



optimized stiffened equivalent ellipsoidal shell; imposed normal displacement w (load set B) removed.

PA= 0.0 PB= 0.0 PX= 0.0; the shell is unloaded and has a residual dent. Θx -0.00

step 158 displacement w contours for residual dent Θy 0.00

nonlinear w ; $\cos(\theta)$ imposed w along row no. 5 of shell segment no. 4 (see Fig.2) removed Θz -0.00

subroutine usrfab.soccerball.plastic.src is used with NGCP = 1

9.900E+00 x

Fig. 271 The **optimized isogrid-stiffened equivalent ellipsoidal shell; Wimp=0.2 inch; the optimum design is listed in columns 2 and 3 of Table 33.** State of the shell at load set B (PB) step no. 158 in Run 4 (**residual dent**). (See Fig. 270). Load set B consists of a number of concentrated inward directed normal **displacements** applied along row 5 of shell segment 4 (Figs. 2, 169, 262) distributed in the circumferential direction as $\cos(\theta)$ from $\theta = 0$ to 90 degrees. This " $\cos(\theta)$ " displacement distribution is used because it generates a residual dent that **locally** resembles the negative of the buckling modal deformation in Fig. 262, that is, the negative of the second linear buckling modal imperfection with $n = 1$ circumferential wave. Compare with Fig. 269. Here the residual dent is somewhat deeper than the depth, Wimp=0.2 inch, of each of the two axisymmetric buckling modal imperfections, mode 1 and mode 2, for which the optimum design was obtained.