



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.

step 55 displacement w contours for residual dent

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

subroutine perfsh-soccerball-elastic is used with MSCB = 4

Fig. 269 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. 55 in Run 2 (**residual dent**). (See Fig. 268). Load set B consists of a number of concentrated inward directed normal **displacements** applied along row 2 of shell segment 2 (Figs. 2, 169, 258, 259, and 264) 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 Figs. 258 and 259, that is, the negative of the linear buckling modal imperfection with $n = 1$ circumferential wave. Compare with Fig. 266. Here the residual dent is significantly deeper than the depth, Wimp=0.2, of each of the two axisymmetric buckling modal imperfections, mode 1 and mode 2, for which the optimum design was obtained.