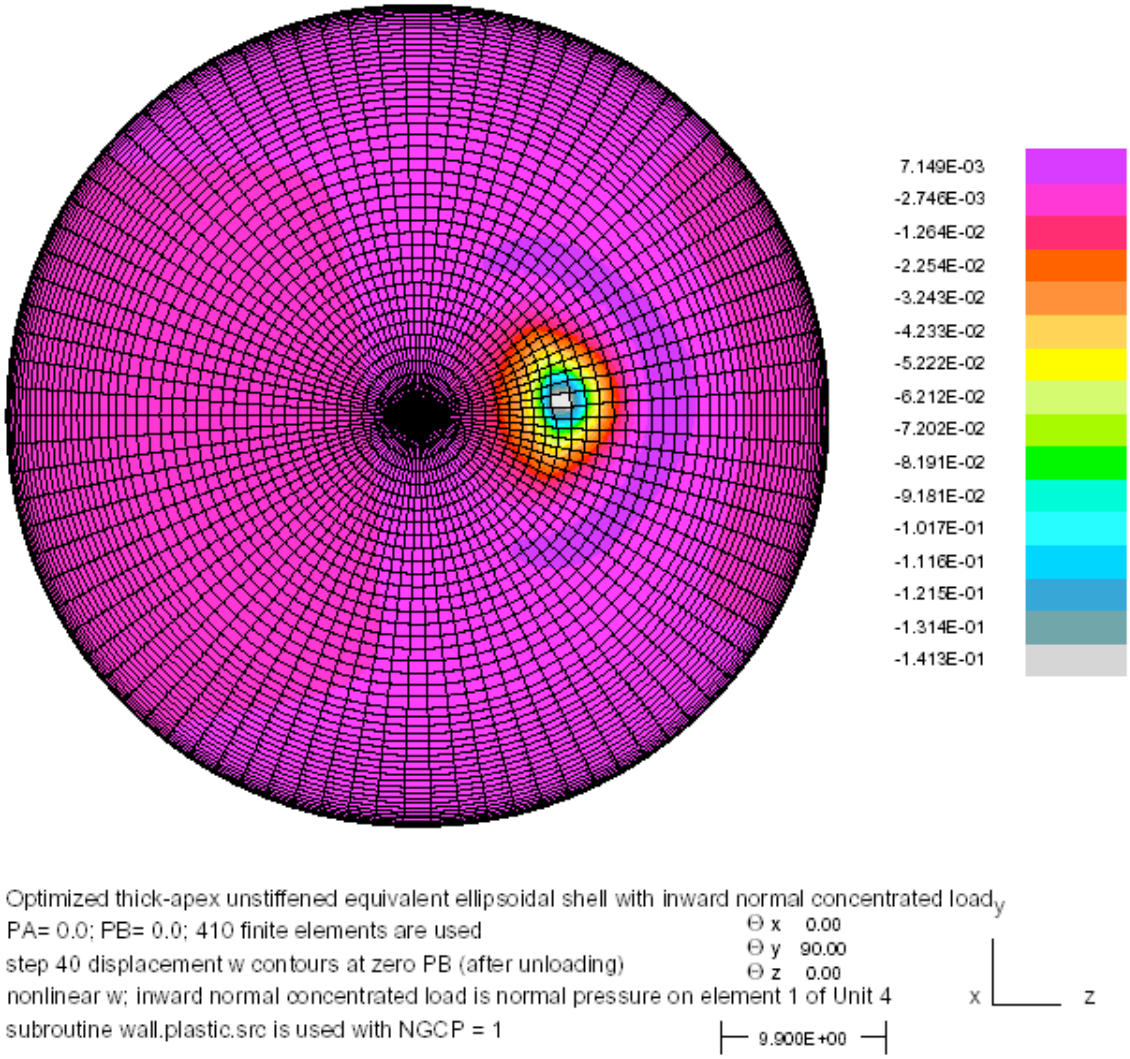

Fig. 165 Elastic-plastic analysis of the **optimized unstiffened equivalent ellipsoidal shell with thick apex, t(apex)=0.4 inch; Wimp=0.2 inch; the optimum design is listed in Table 78.** This figure shows the end of the **second phase**, the unloading phase, of a STAGS run the objective of which is to produce a **residual dent** with depth fairly close to 0.2 inch, which is the amplitude of the axisymmetric buckling modal imperfection, Wimp=0.2 inch, that was used during optimization of the shell. In this case the dent is produced in Load Set B by application of normal, inward-directed pressure over a **single finite element** in the STAGS model. Displayed here is the **residual dent** remaining after the concentrated load, PB, has been removed and before the dented shell is loaded by the uniform external pressure, PA. Unfortunately, the residual dent is not deep enough (0.1413 inch instead of 0.2 inch). **When the user-written SUBROUTINE WALL is employed, STAGS cannot find a converged solution for a high enough concentrated load PB to produce a residual dent (a dent remaining when PB = 0) with a depth greater than about 0.1413 inch. Therefore, SUBROUTINE WALL cannot be used for the production of dents for this class of problems.** The input file, *.bin, used for the unloading phase of the production of the residual dent, is listed in Table 83.