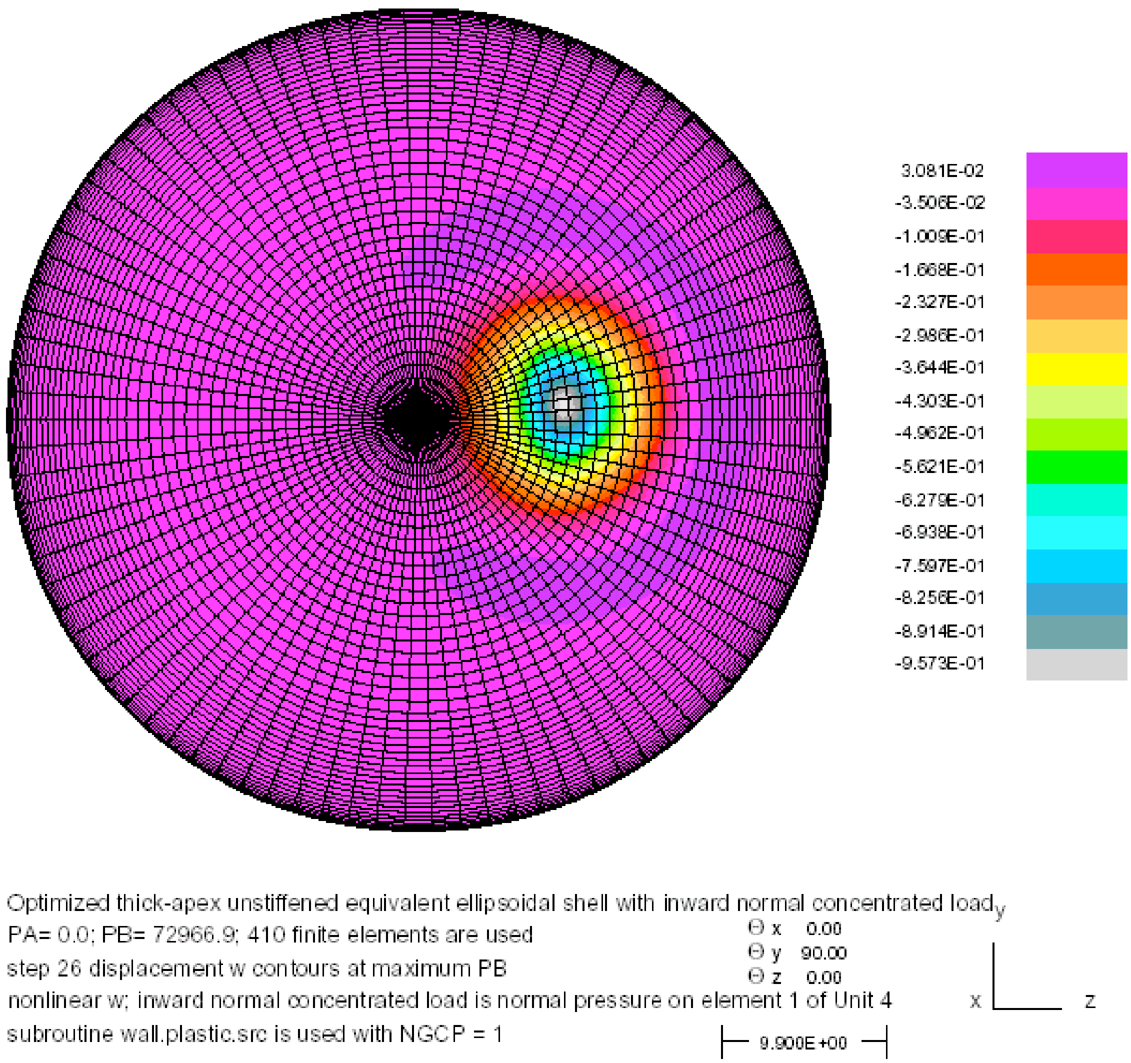

Fig. 164 Elastic-plastic analysis of the **optimized unstiffened equivalent ellipsoidal shell with thick apex, t(apex)=0.4 inch; Wimp=0.2 inch; the optimum design is listed in Table 78. This figure shows the first phase, the loading phase, of a series of STAGS runs the objective of which is to produce 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.** The residual dent is produced by a load cycle in Load Set B (PB being the load factor) applied to the elastic-plastic shell. In this case the dent is produced by application of normal inward-directed pressure over a **single finite element** in the STAGS model. Here we see the dent as loaded by the maximum load factor, PB, for which STAGS was able to obtain a converged solution of the large deflection, elastic-plastic problem. Shown in the next figure is the residual dent remaining after the concentrated load, PB, has been removed and before the dented shell has been loaded by Load Set A (with load factor, PA), in which the uniform external pressure is applied. In this case the user-written **SUBROUTINE WALL** was employed. The STAGS input file, *.inp, for this case is listed in Table 82.