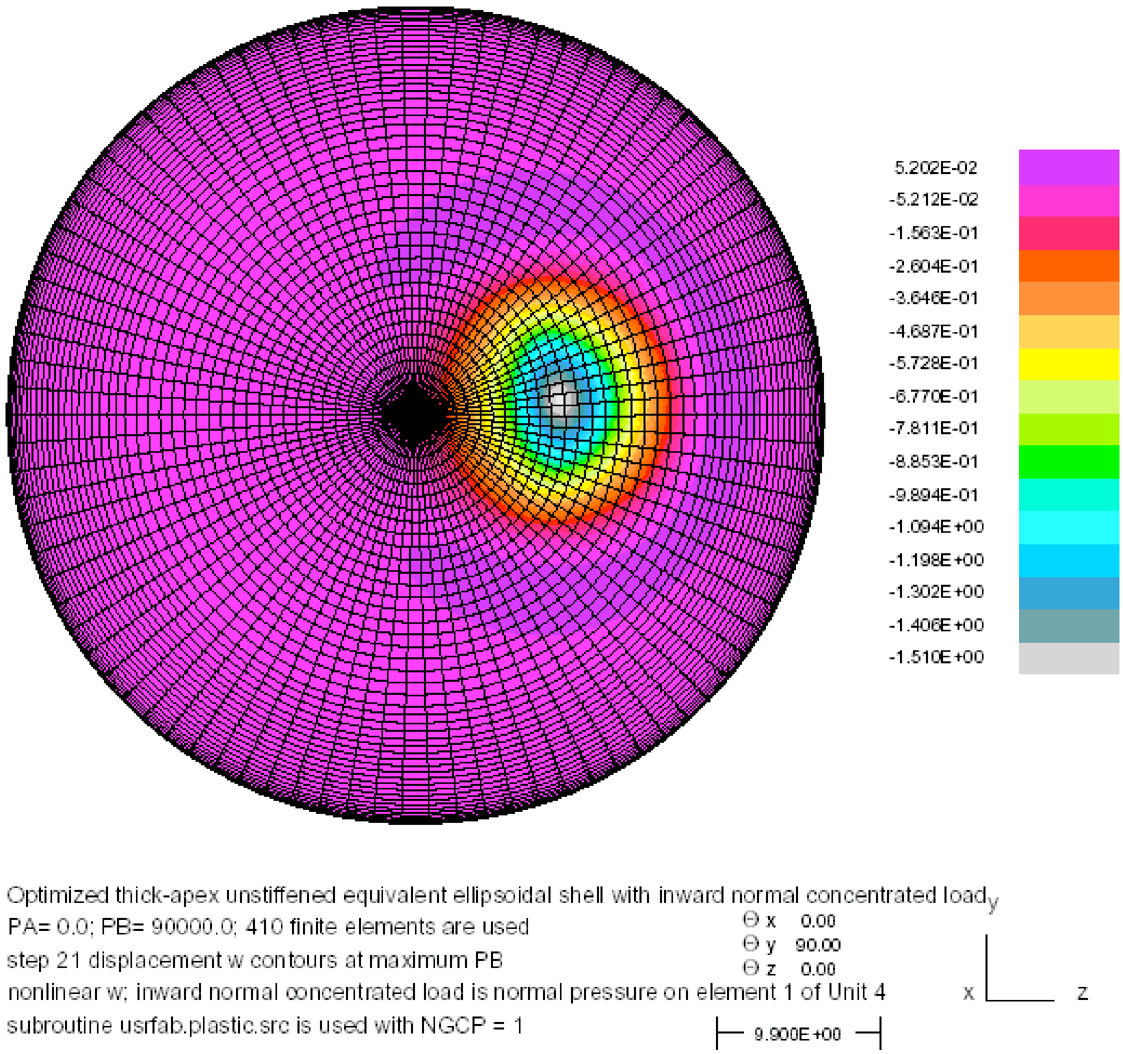

Fig. 166 Elastic-plastic analysis of the **optimized unstiffened equivalent ellipsoidal shell with thick apex, t(apex)=0.4 inch; Wimp=0.2 inch; the optimum design is listed in Table 78.** This figure shows the **first phase**, the loading phase, of a series of STAGS runs the objective of which is to 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. In this case the dent is produced in Load Set B (load factor, PB) 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 = 90000.0 = FACM(2), specified by the STAGS user (the writer) in the input data file, *.bin. 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 the uniform external pressure, PA. **In this case the user-written SUBROUTINE USRFAB was employed**, not the user-written SUBROUTINE WALL. Note that the depth of the dent at the maximum value of PB is 1.510 inches here. When SUBROUTINE WALL was used, STAGS was not able to find a converged solution for a loaded dent deeper than about 0.957 inch. (See Fig. 164). The input file, *.inp, for this case is listed in Table 84.