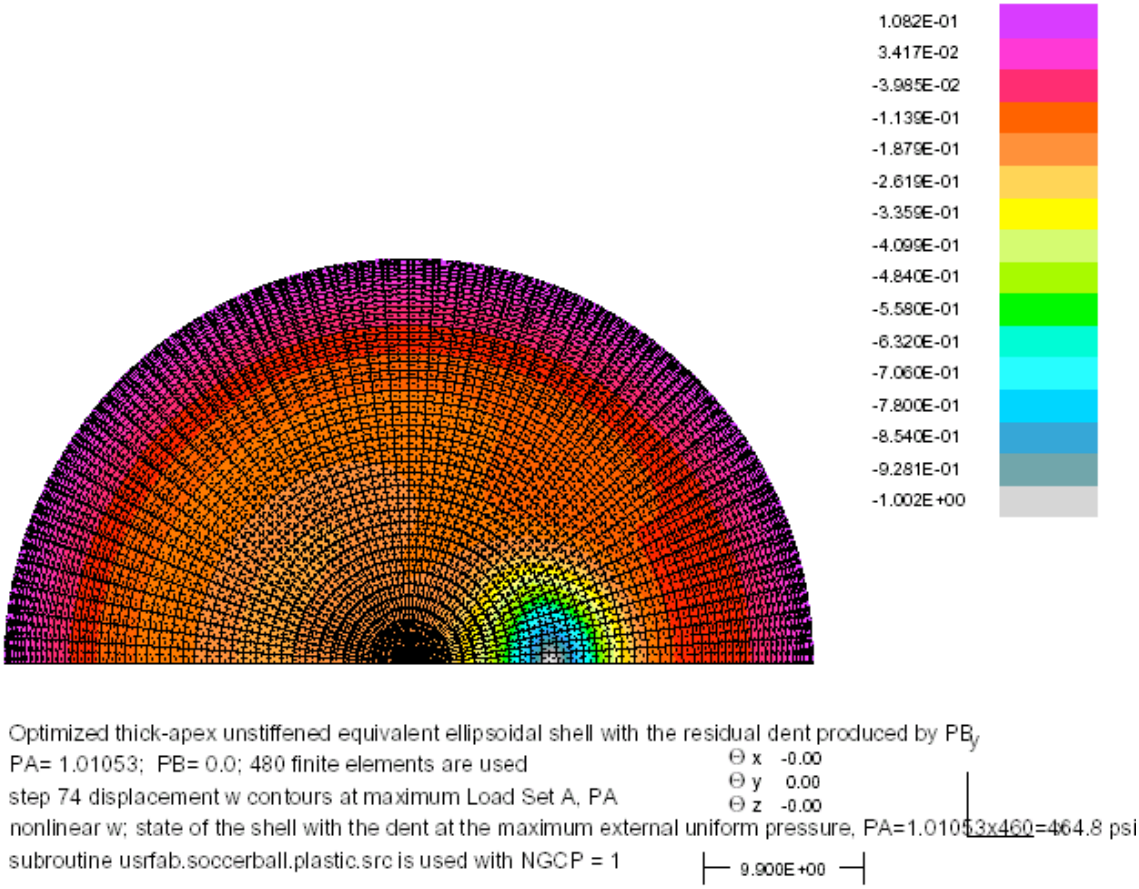

Fig. 174 Elastic-plastic analysis of the **optimized unstiffened equivalent ellipsoidal shell with thick apex, t(apex)=0.4 inch; Wimp=0.2 inch; the optimum design is listed in Table 78.** This figure pertains to the same shell depicted in the previous four figures. Shown here is the state of the shell with the residual dent when the dented shell is subsequently loaded by uniform external pressure with load factor, PA = 1.01053, which is the maximum load factor attained for this imperfect shell. (See the last trace in Fig. 176-squares with X inside). Therefore, the shell with a residual dent of depth 0.297 inch (Fig. 171) has a load-carrying capacity about equal to the design load, PA = 1.0 (external pressure = 460 psi) even though the amplitude of the imperfection (the residual dent) significantly exceeds the amplitude, Wimp = 0.2 inch, of the axisymmetric linear buckling modal imperfection in the presence of which the shell was optimized. **(Later it will be seen that more harmful residual dents are produced by a group of imposed normal inward-directed line loads or imposed normal inward-directed line displacements applied at various radii from the axis of revolution and distributed as cos(theta) over a circumference from theta = 0 to 90 degrees.)**