The first eigenfunction of $U_{xx} + U_{yy} + U_{zz} = \lambda U$, in the portion of a sphere shown below (with $\frac{\partial U}{\partial n} = 0$ on one face and $U = 0$ on the rest of the boundary), is displayed at P1,P2 or P3=constant cross-sections on the following pages. For this problem this means constant radius, constant latitude and constant longitude cross-sections. These plots were created by running the MATLAB program automatically generated by PDE2D 9.3.
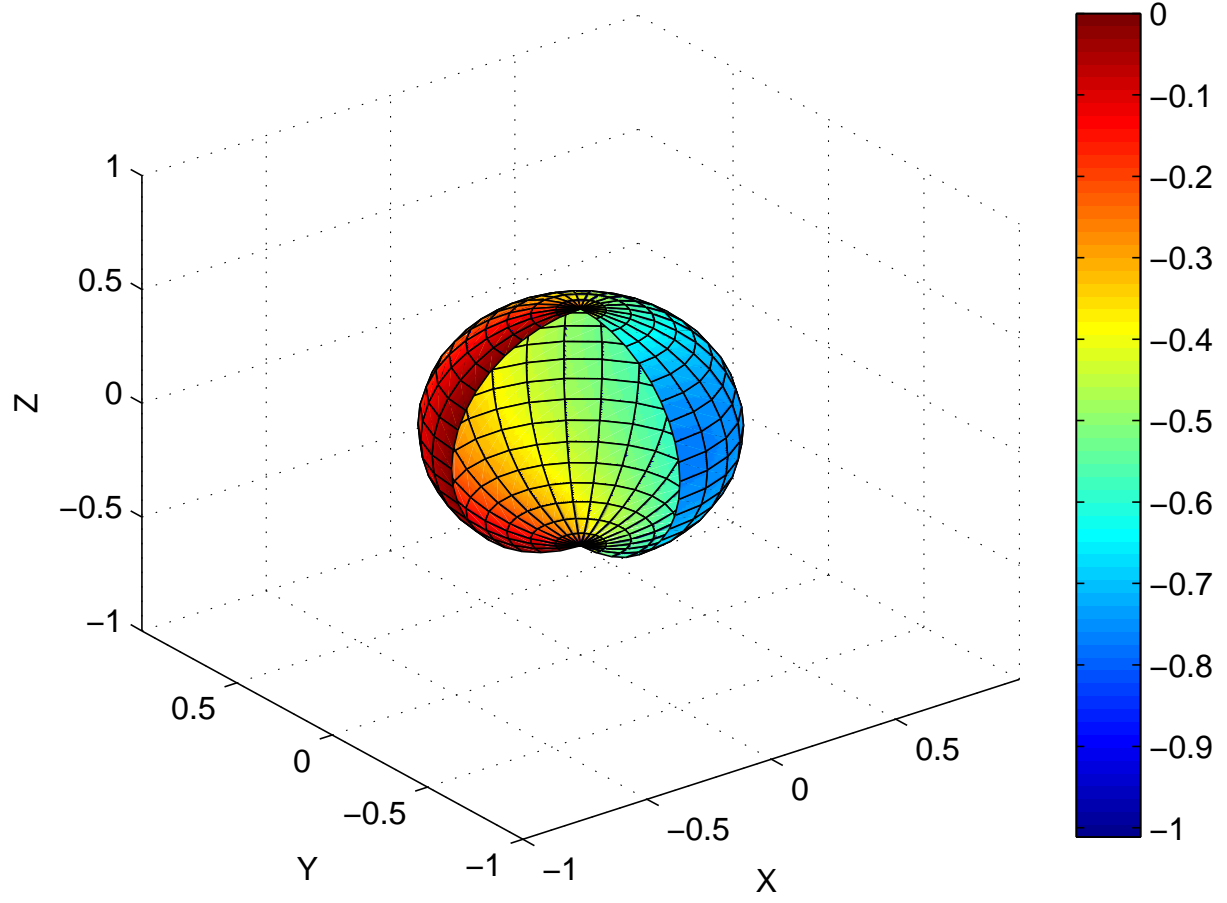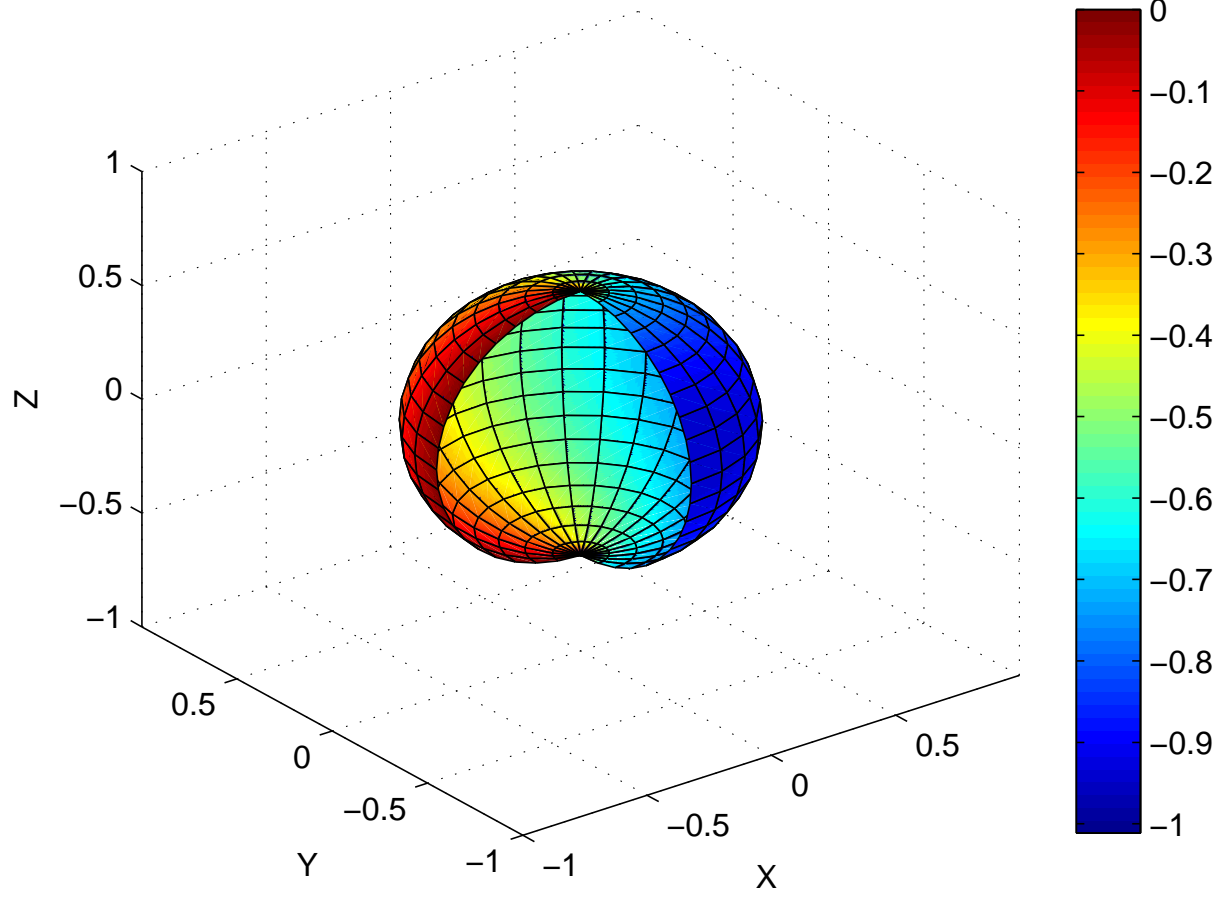
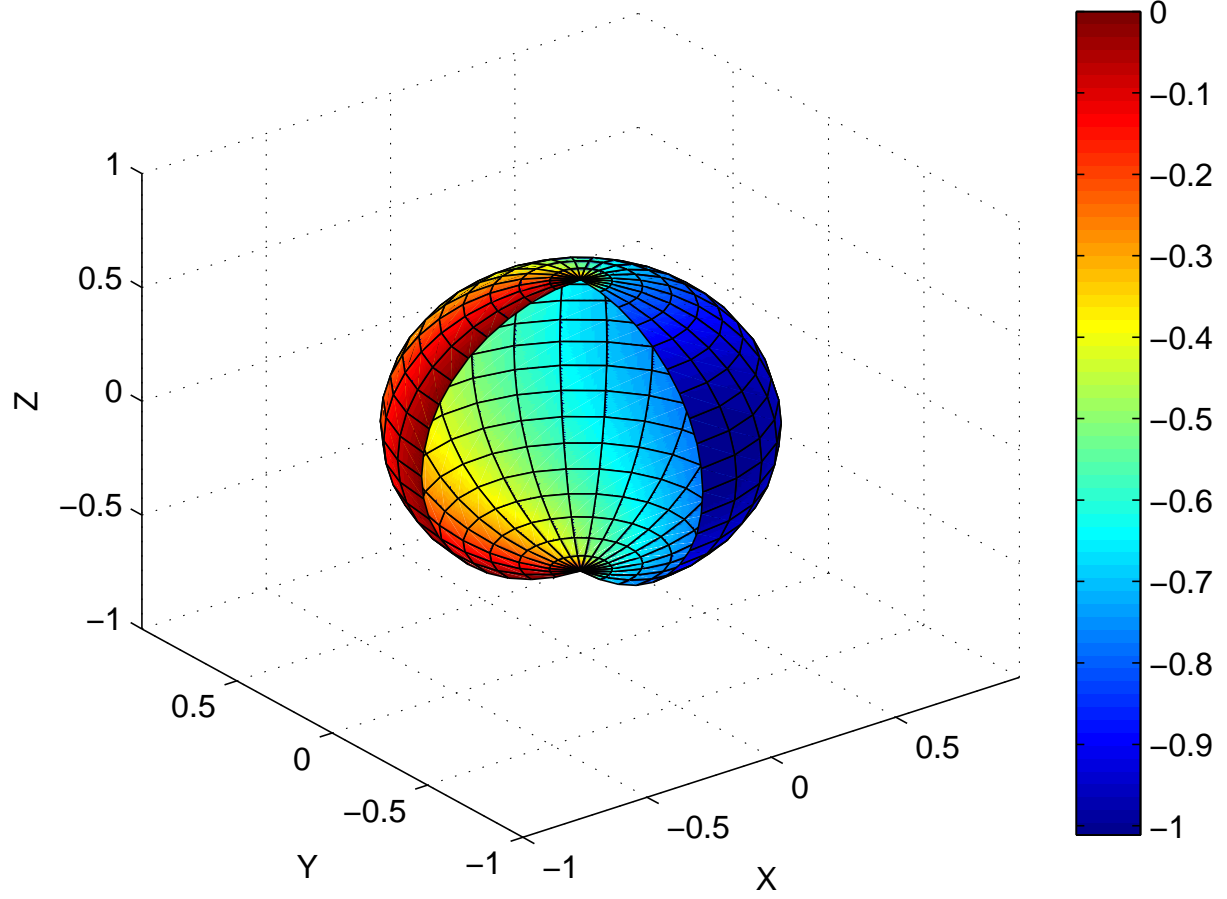Region and output grid



1

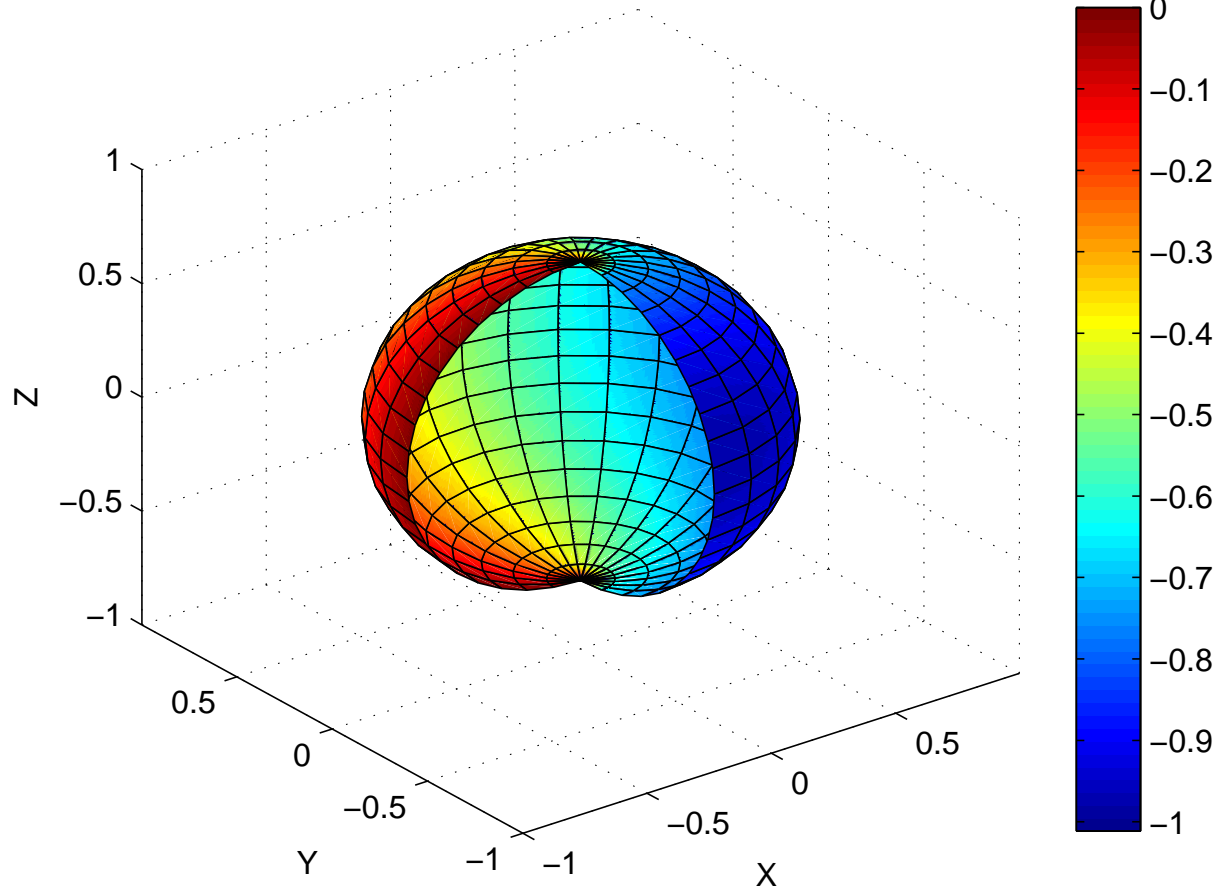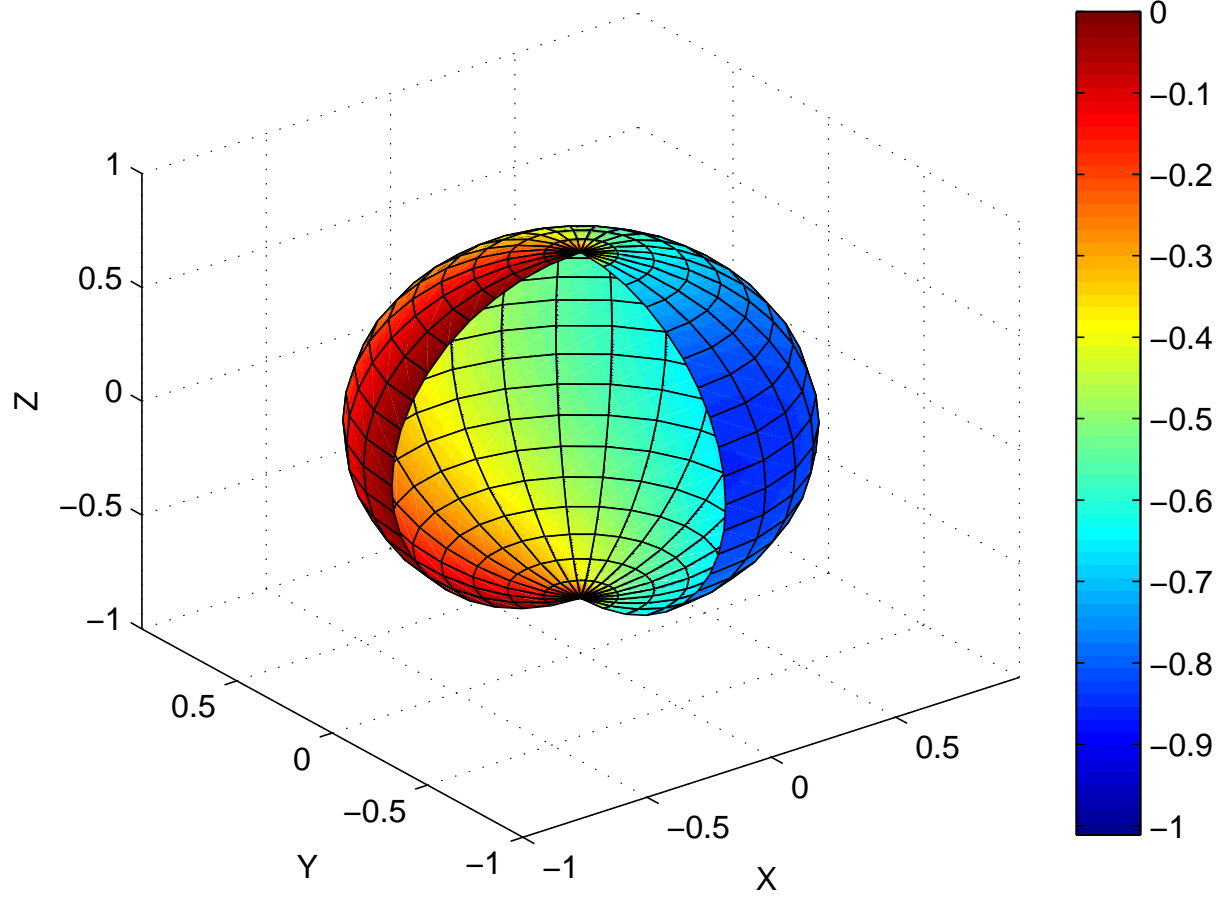T = 25,  P1 = 0.4

T = 25, P1 = 0.46

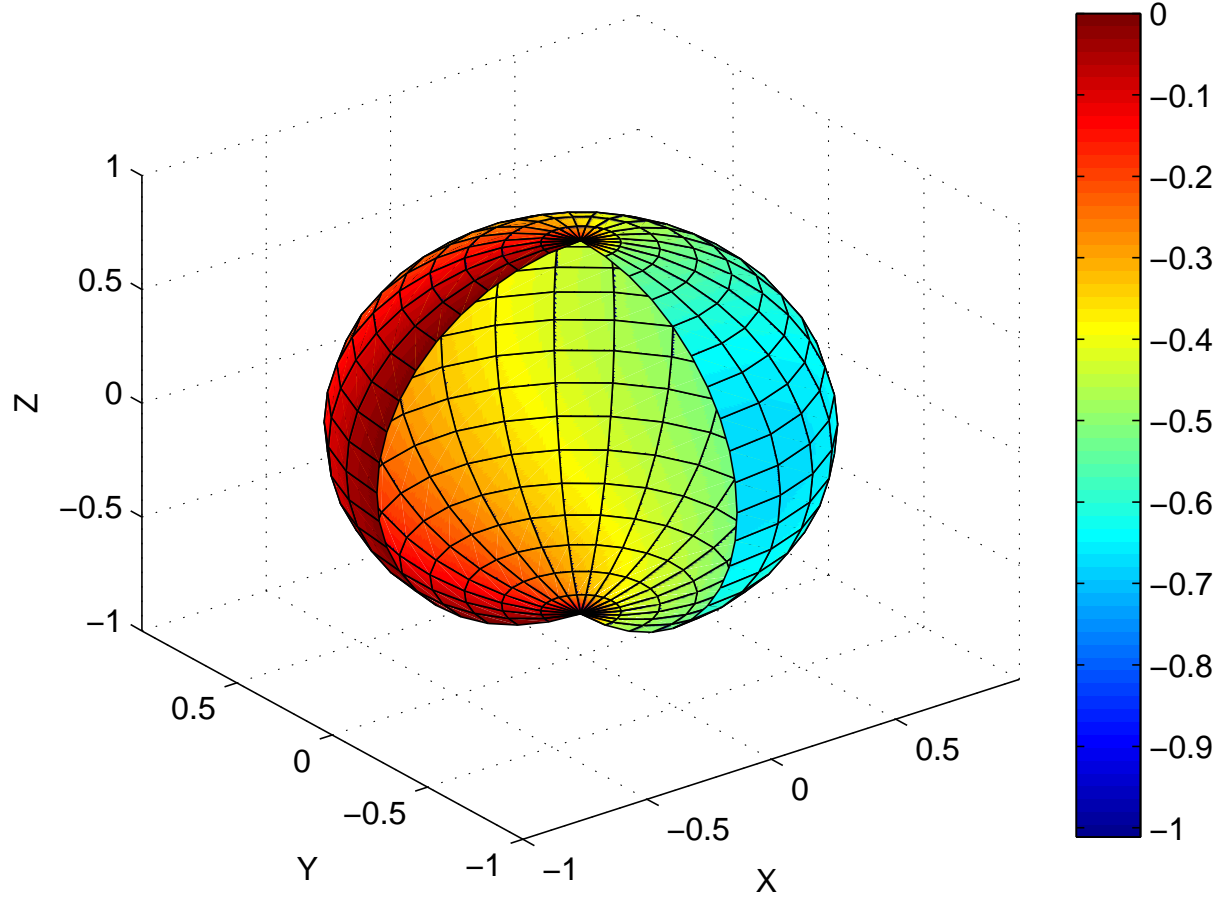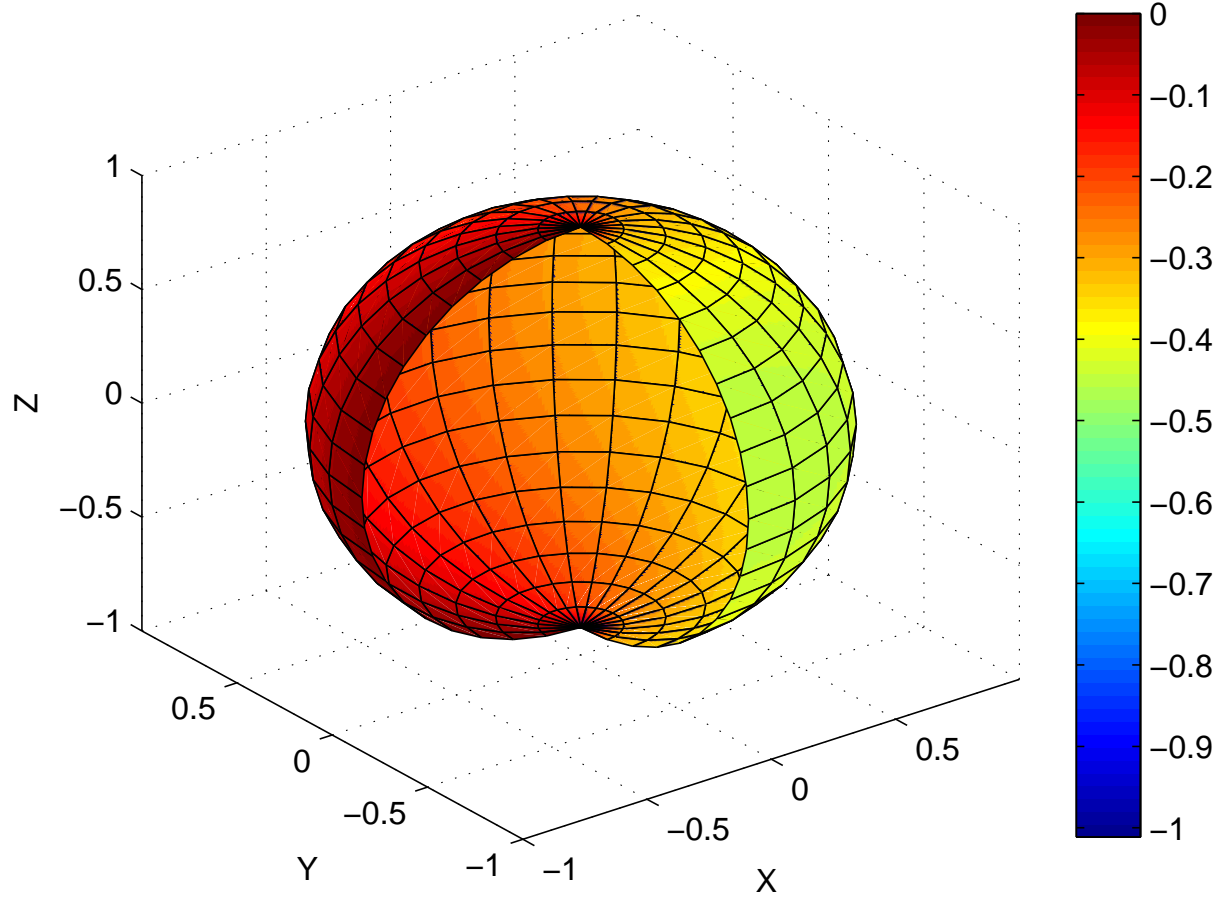3
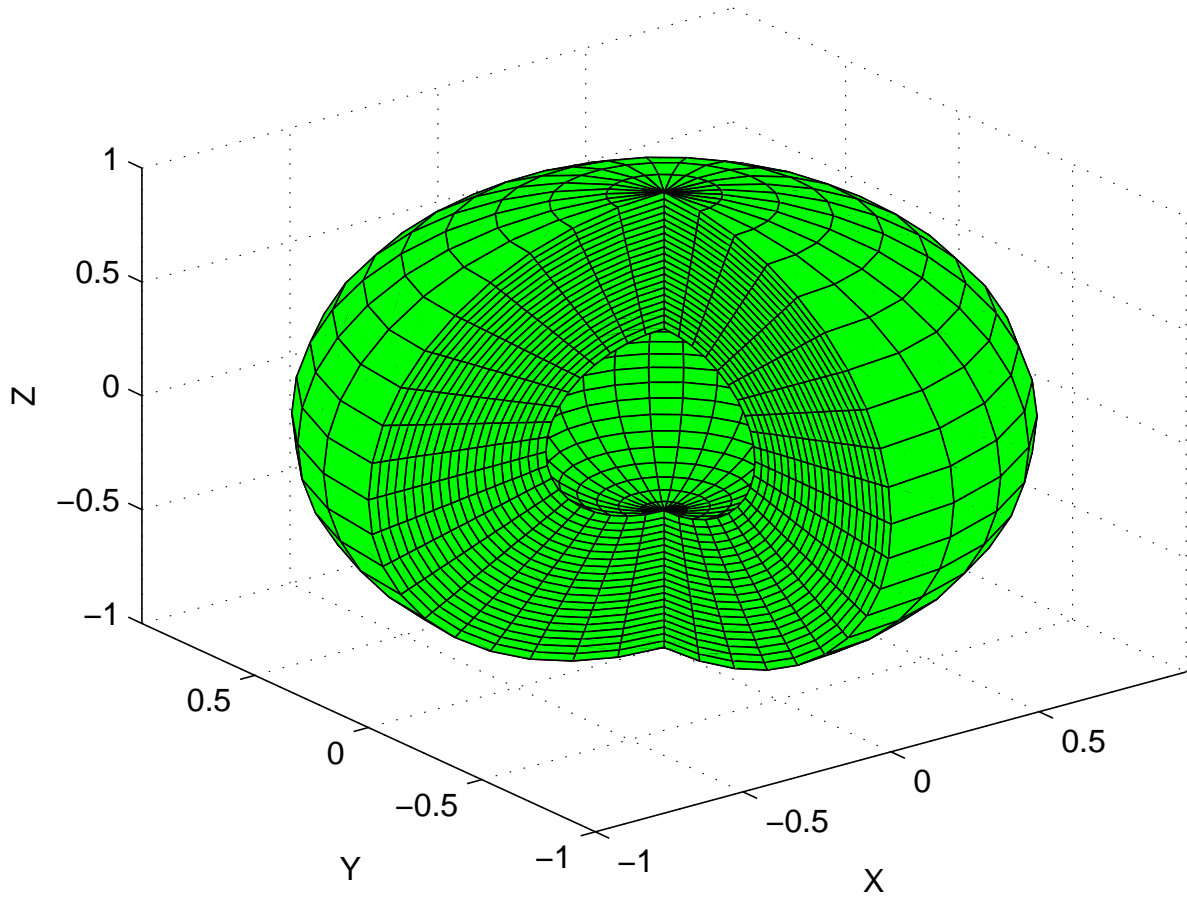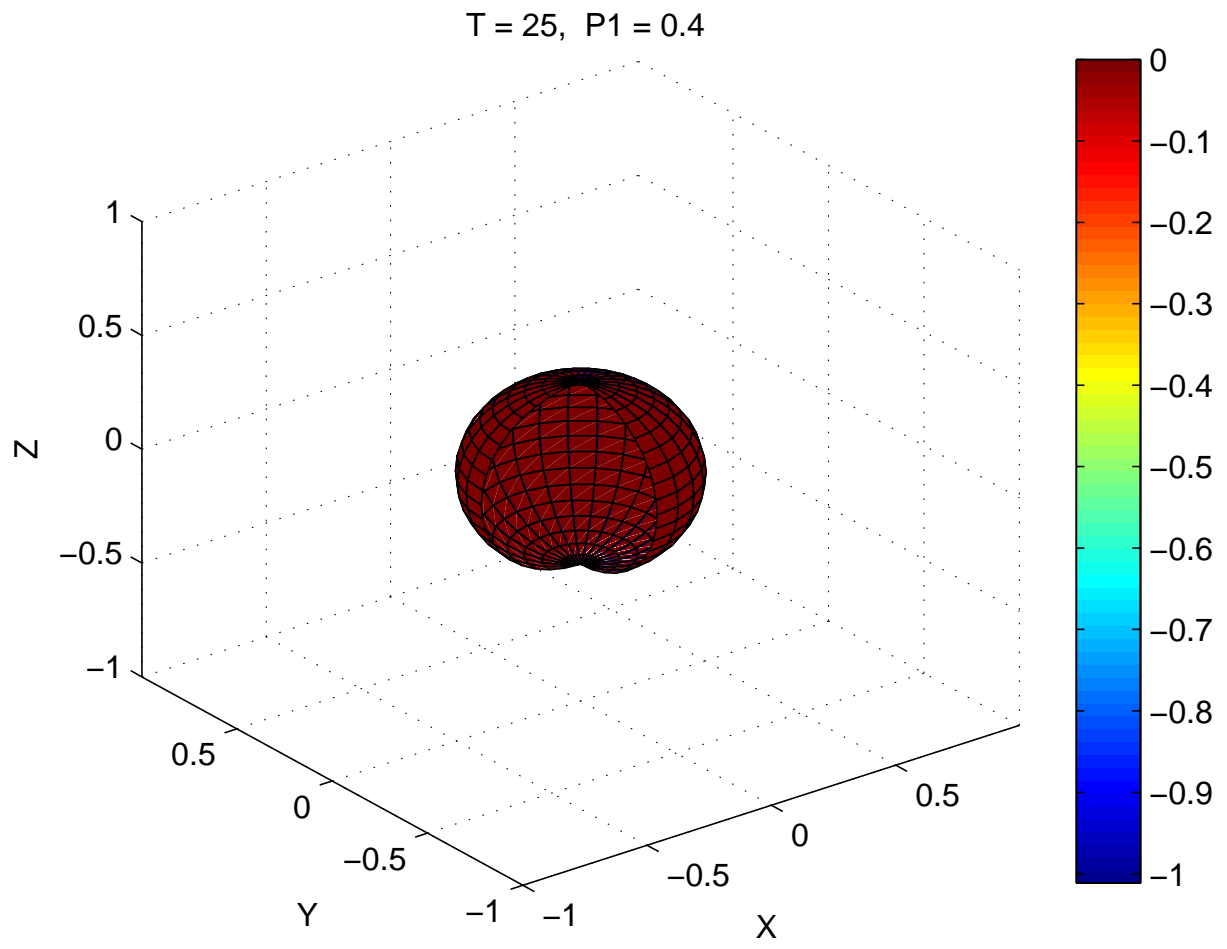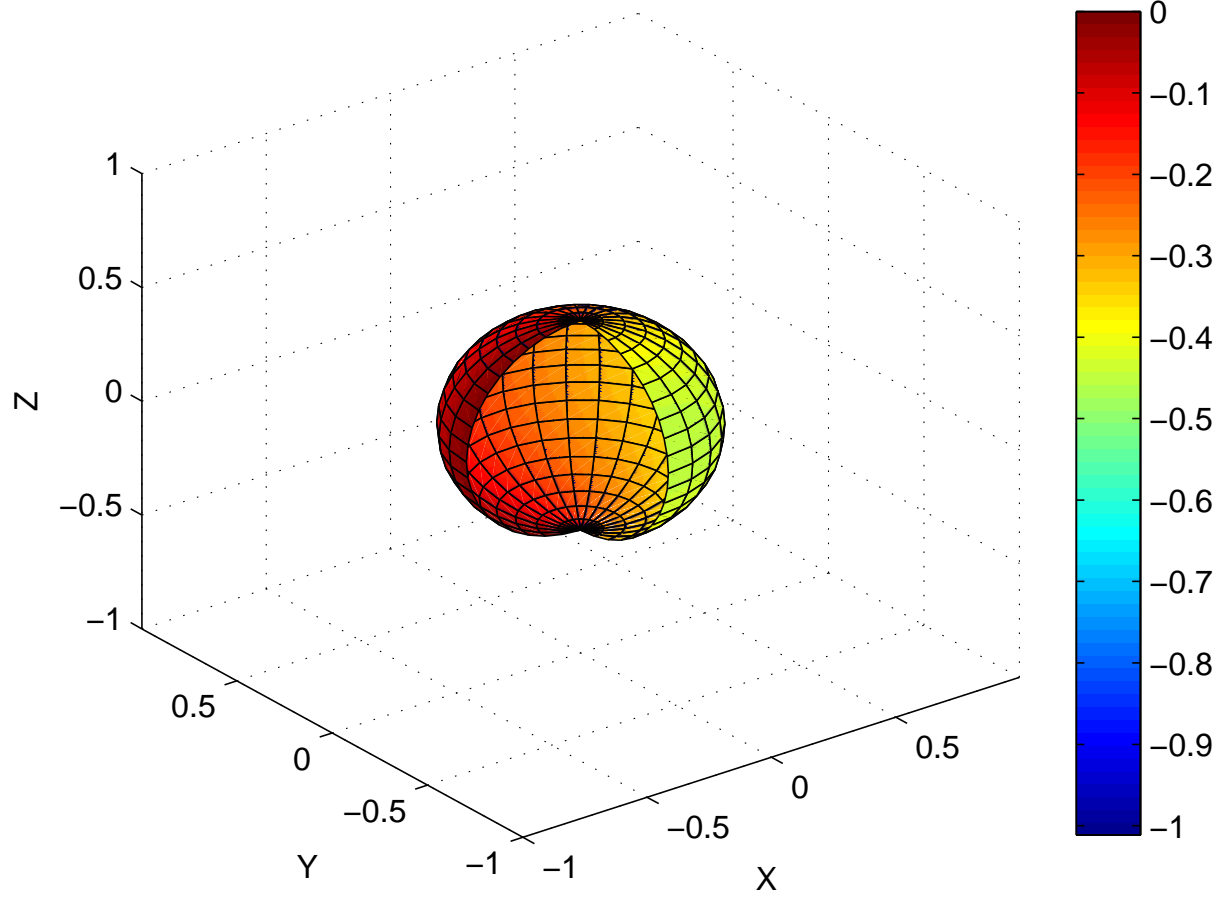
T = 25,  P1 = 0.52

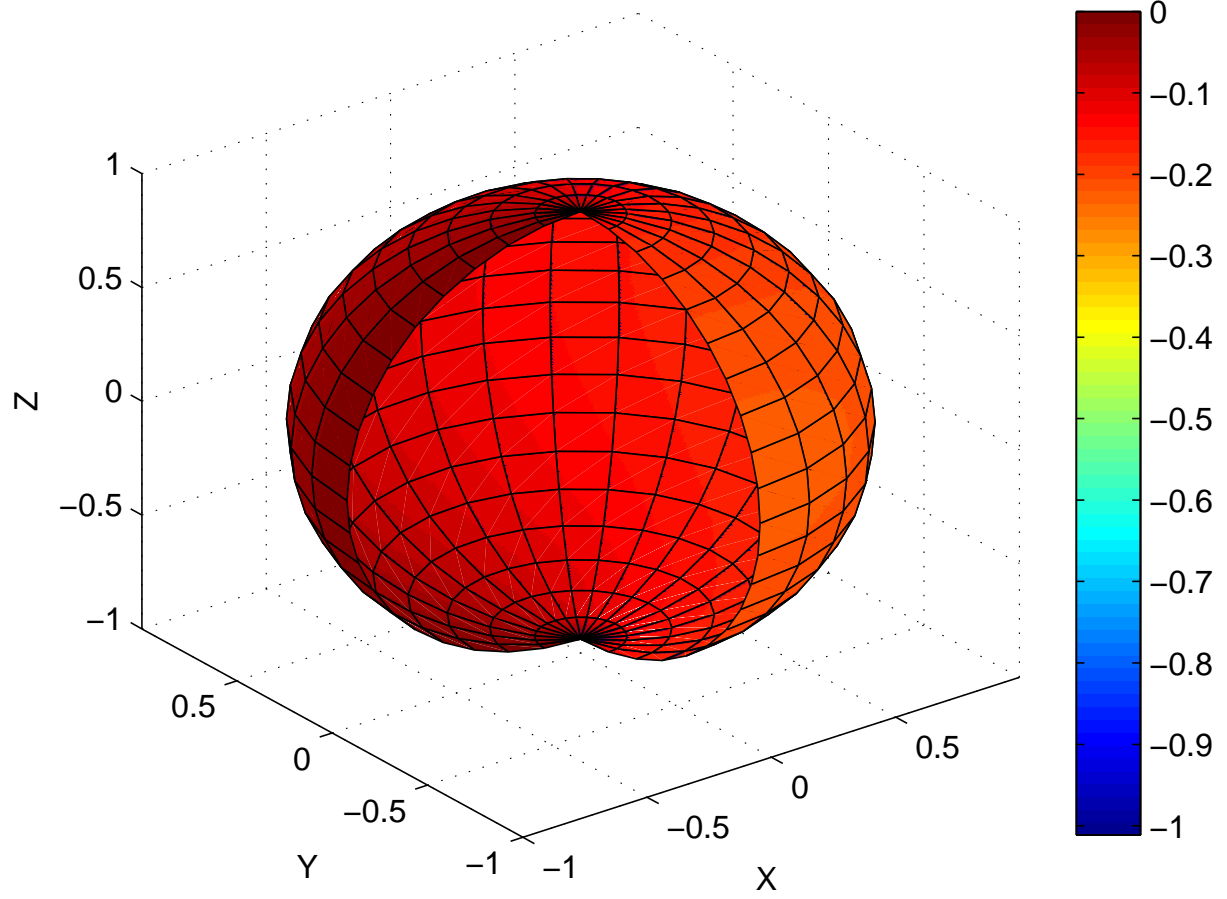T = 25, P1 = 0.58

T = 25,  P1 = 0.64
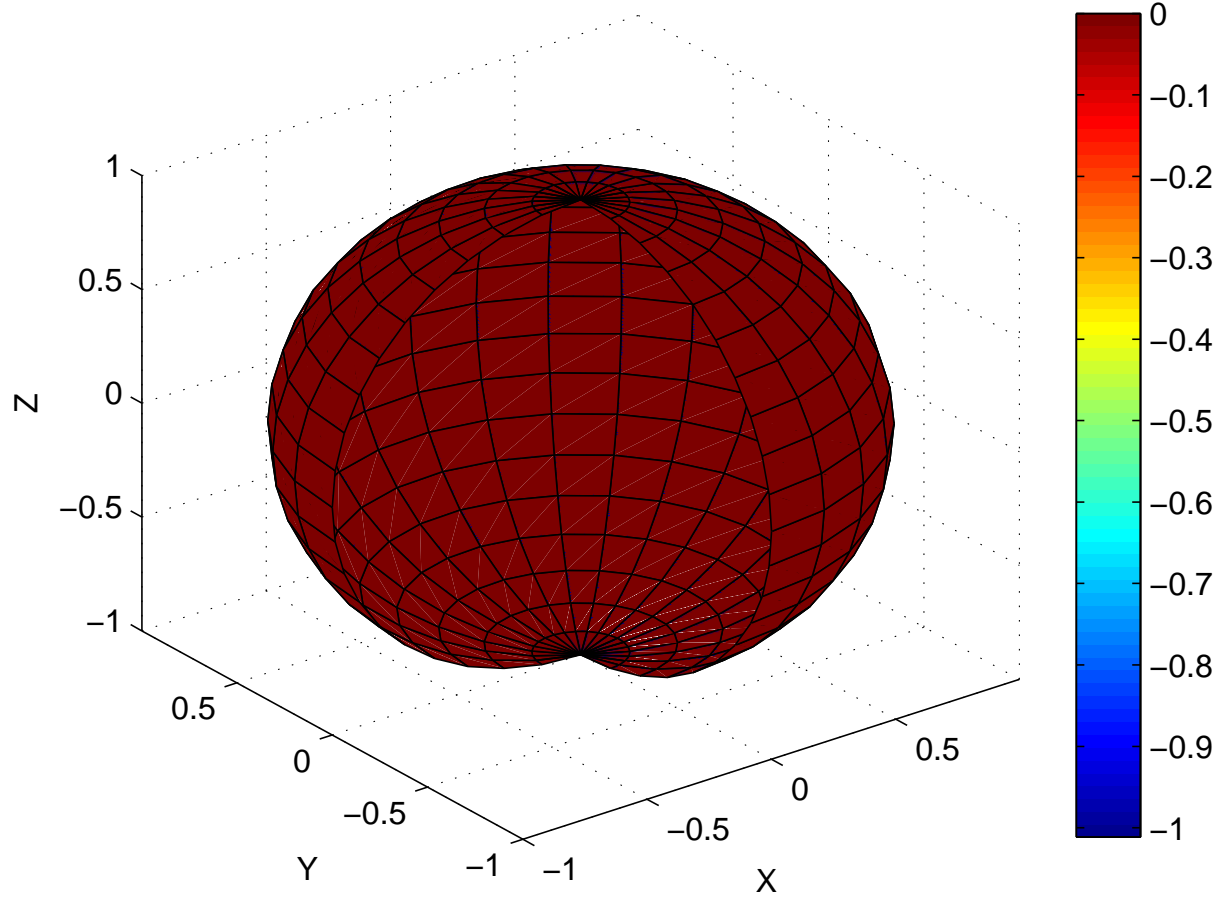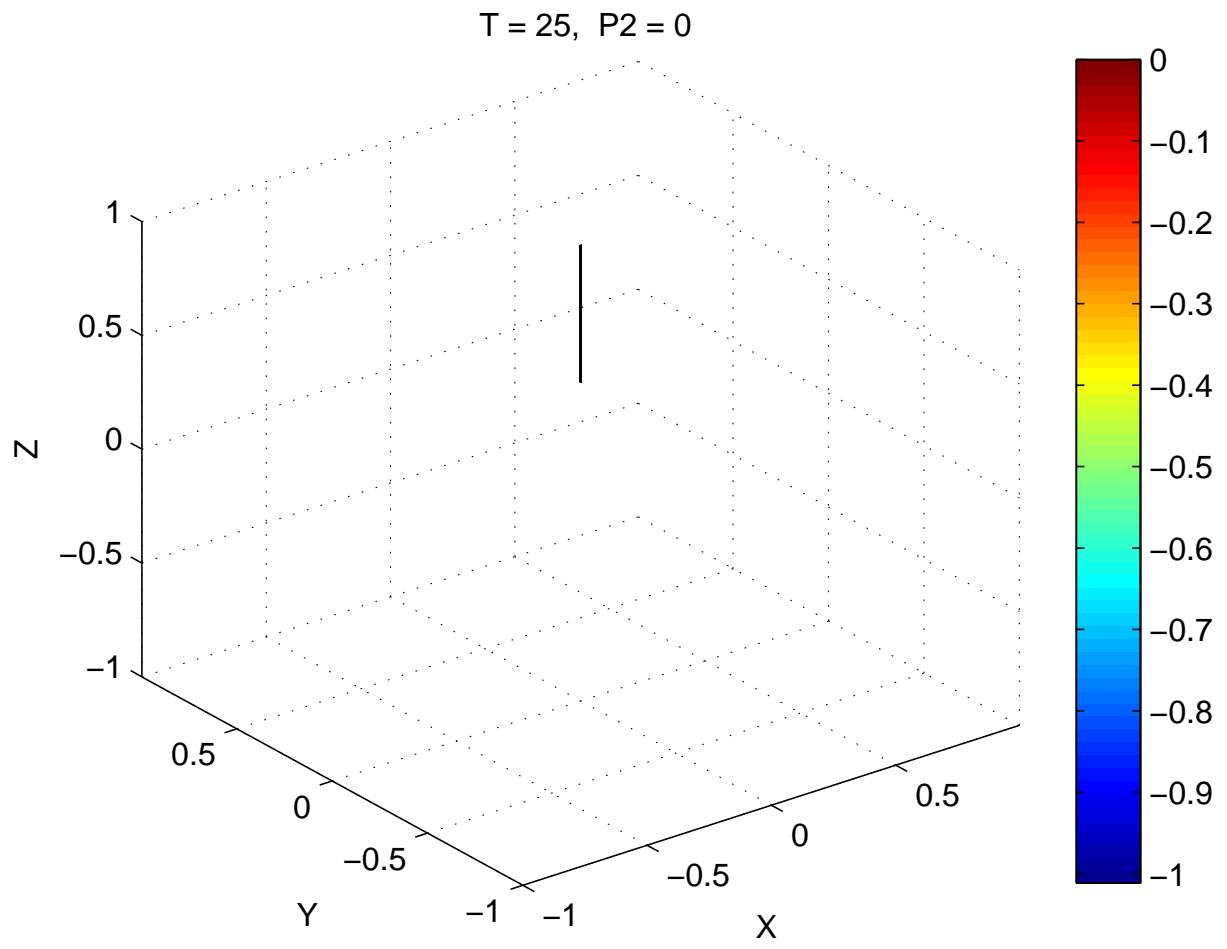
T = 25, P1 = 0.7

T = 25, P1 = 0.76

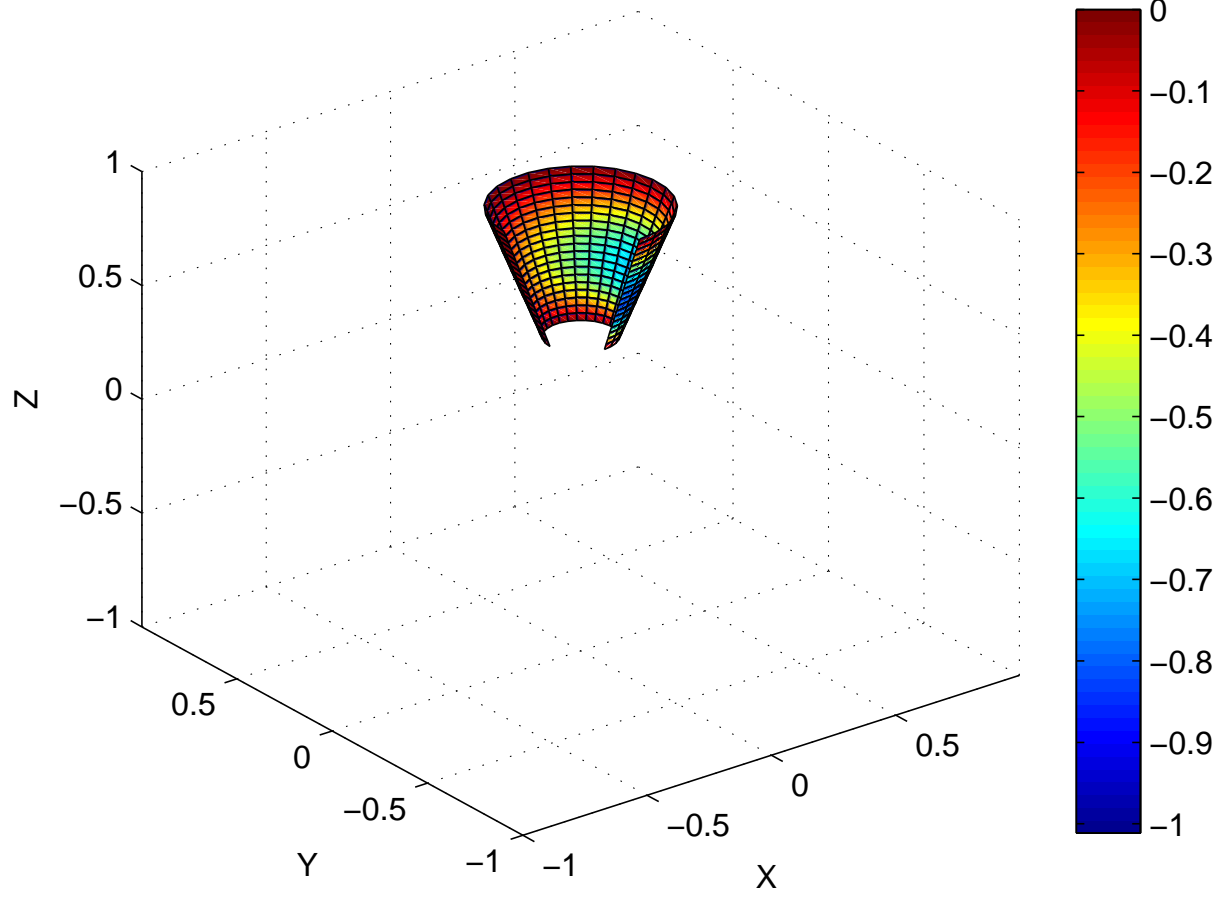T = 25,  P1 = 0.82

9

T = 25, P1 = 0.88

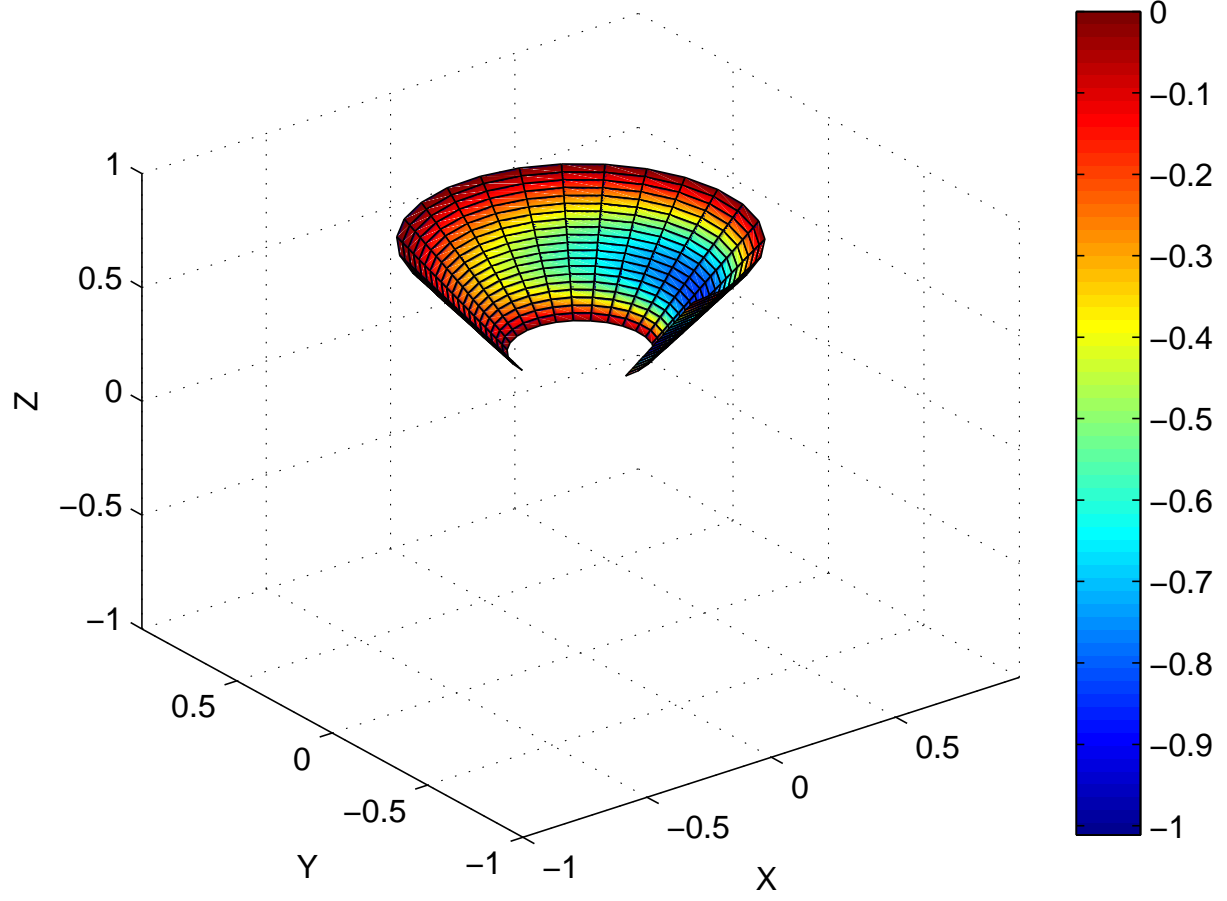T = 25, P1 = 0.94
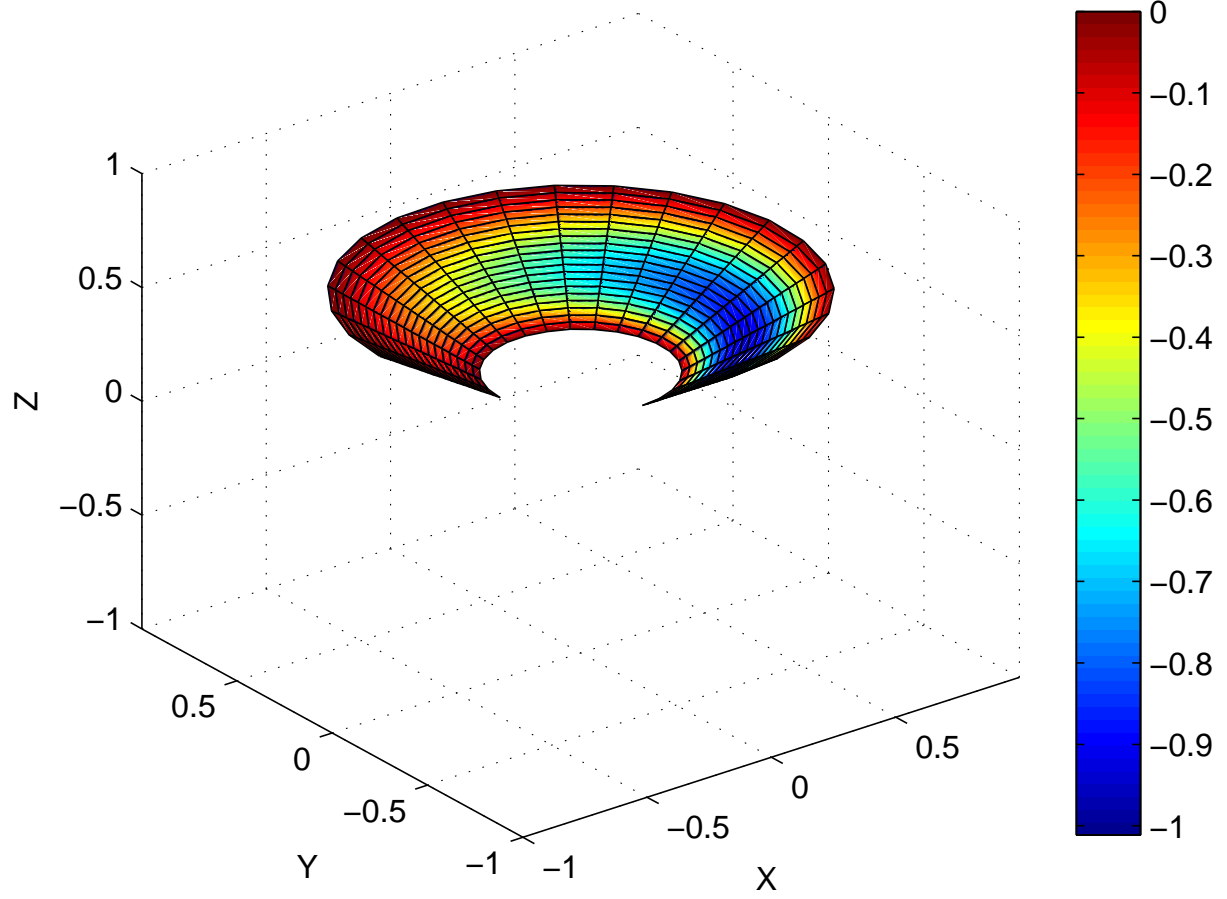
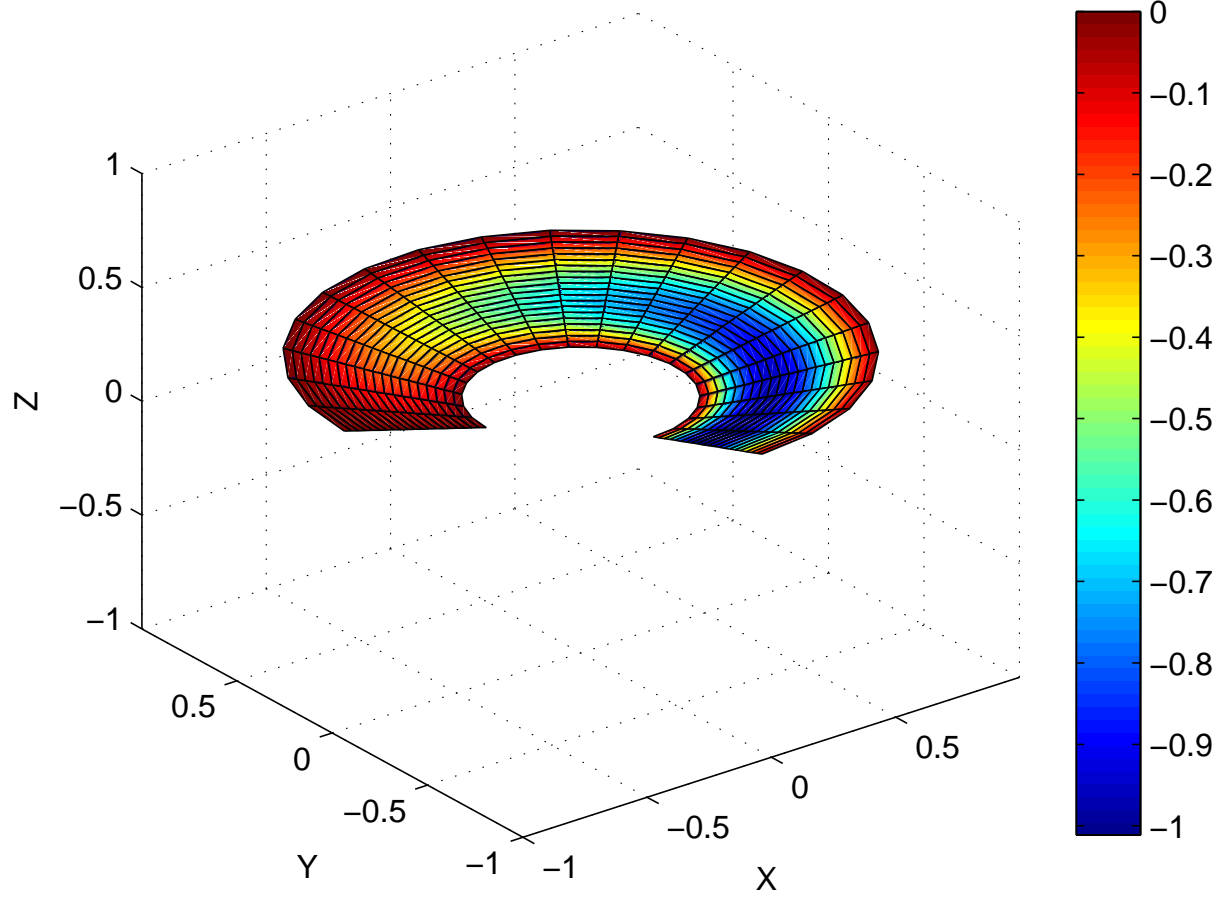11

T = 25,  P1 = 1

12

T = 25,  P2 = 0

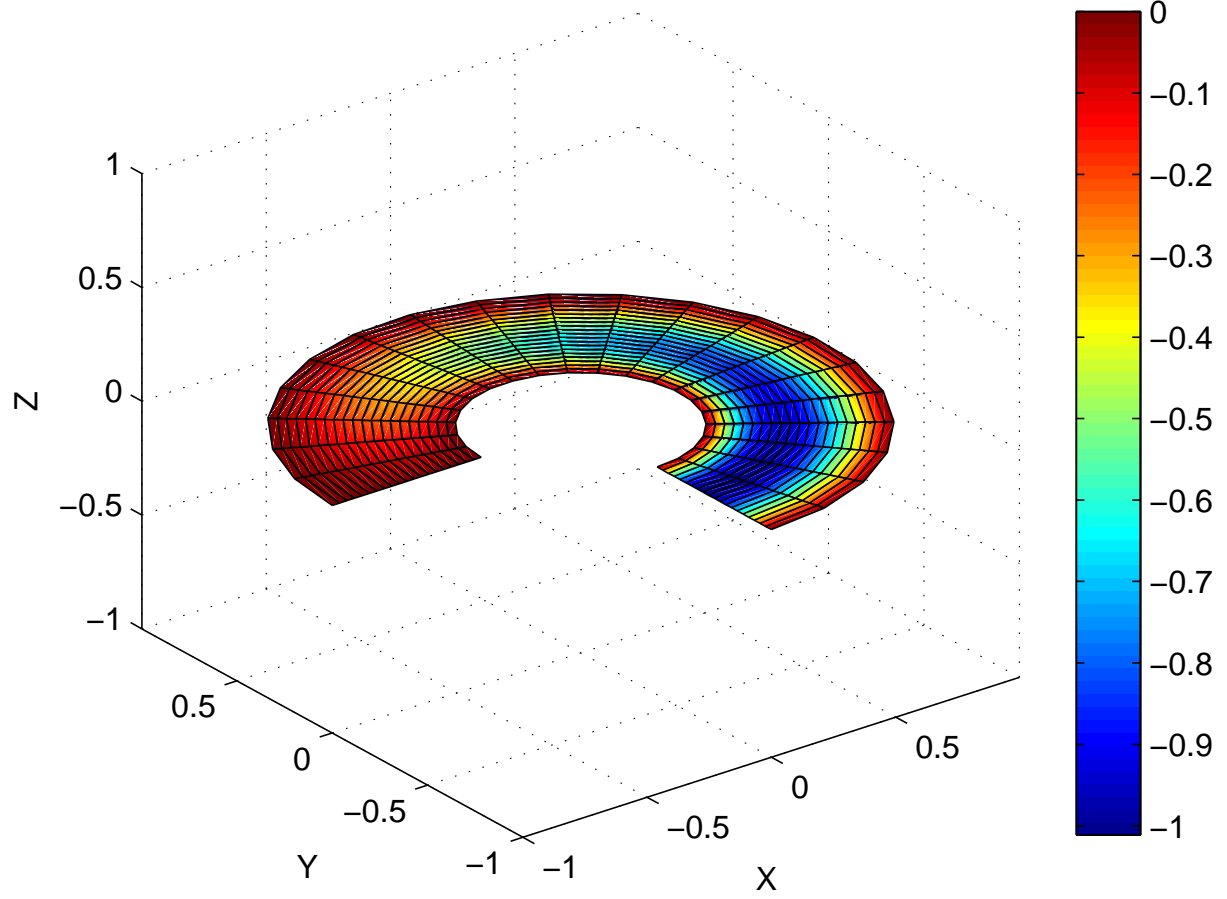## T = 25, P2 = 0.31416
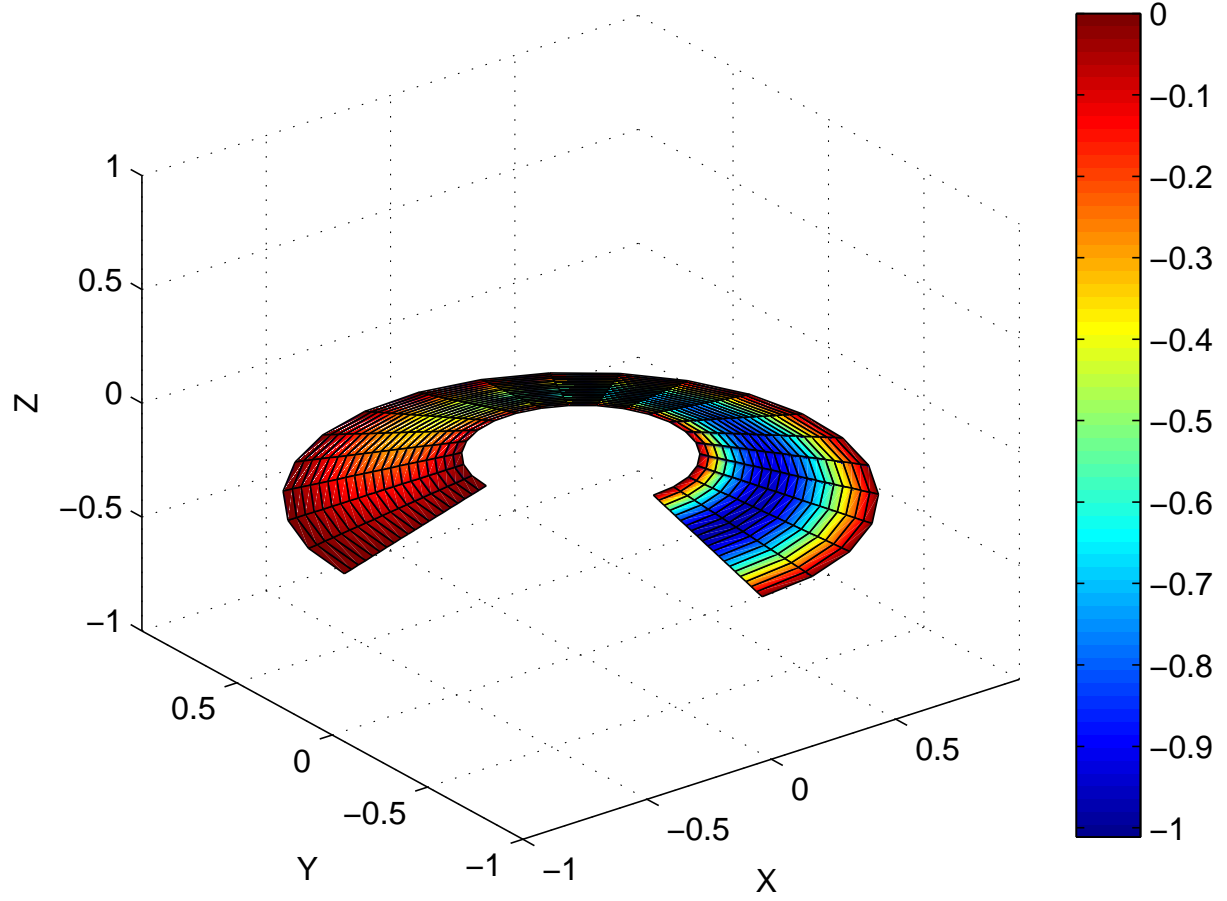
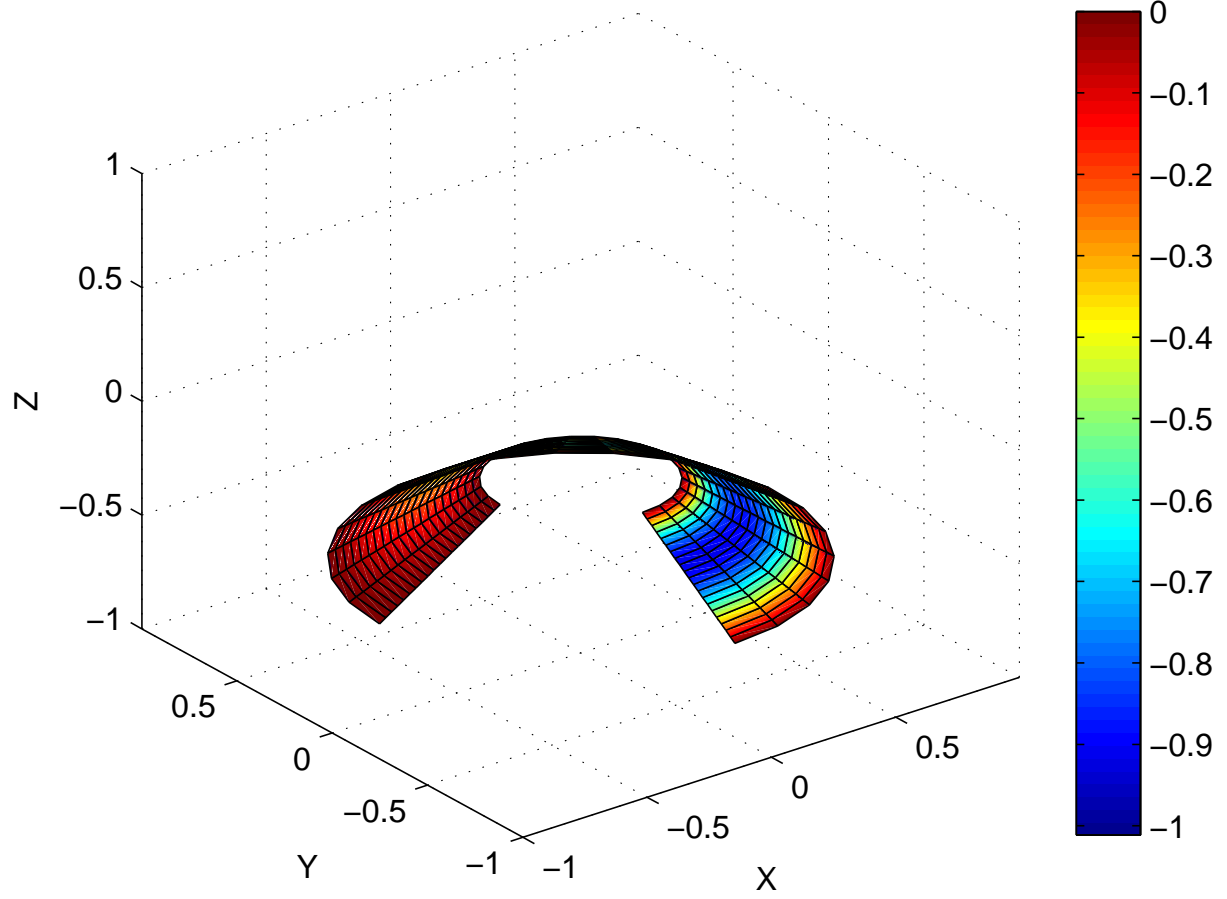T = 25,  P2 = 0.62832

15
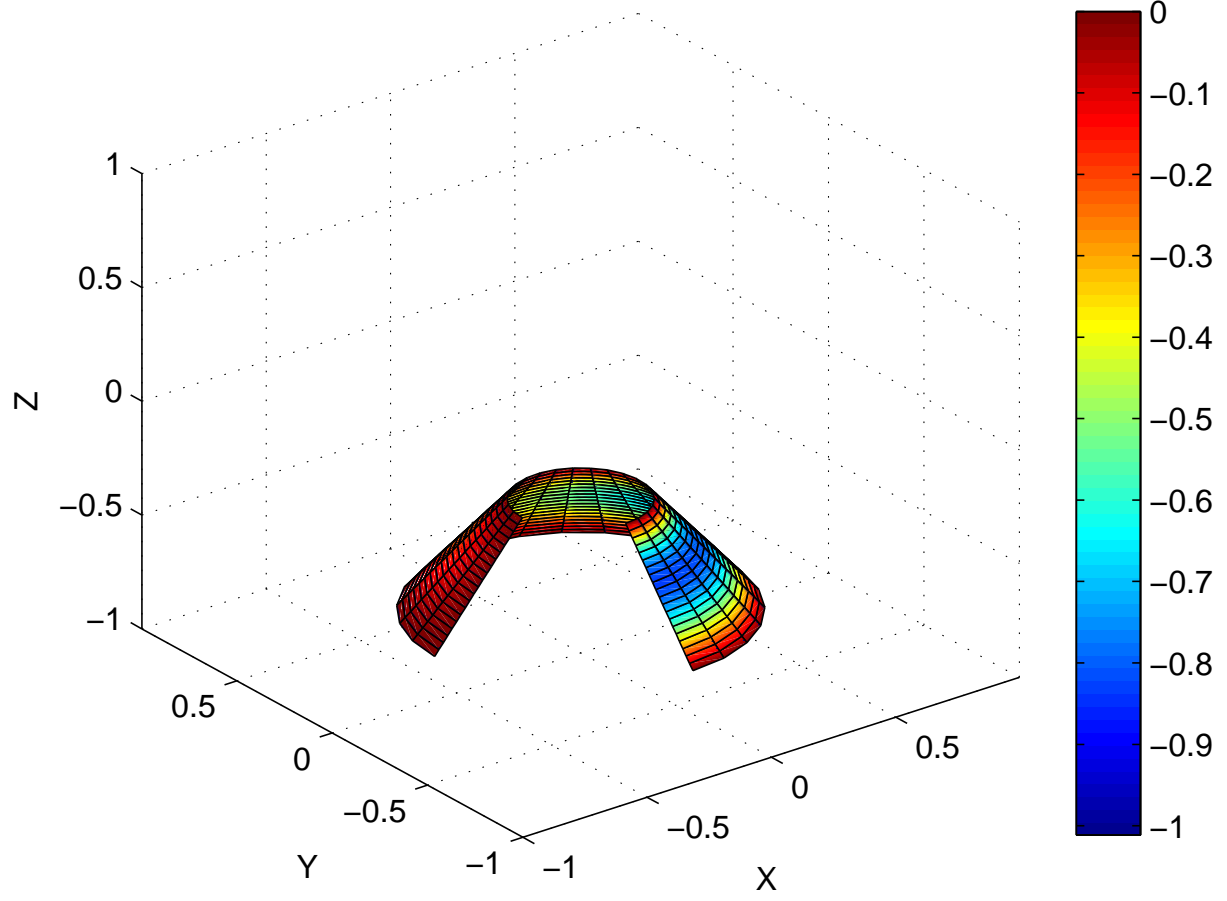
T = 25,  P2 = 0.94248
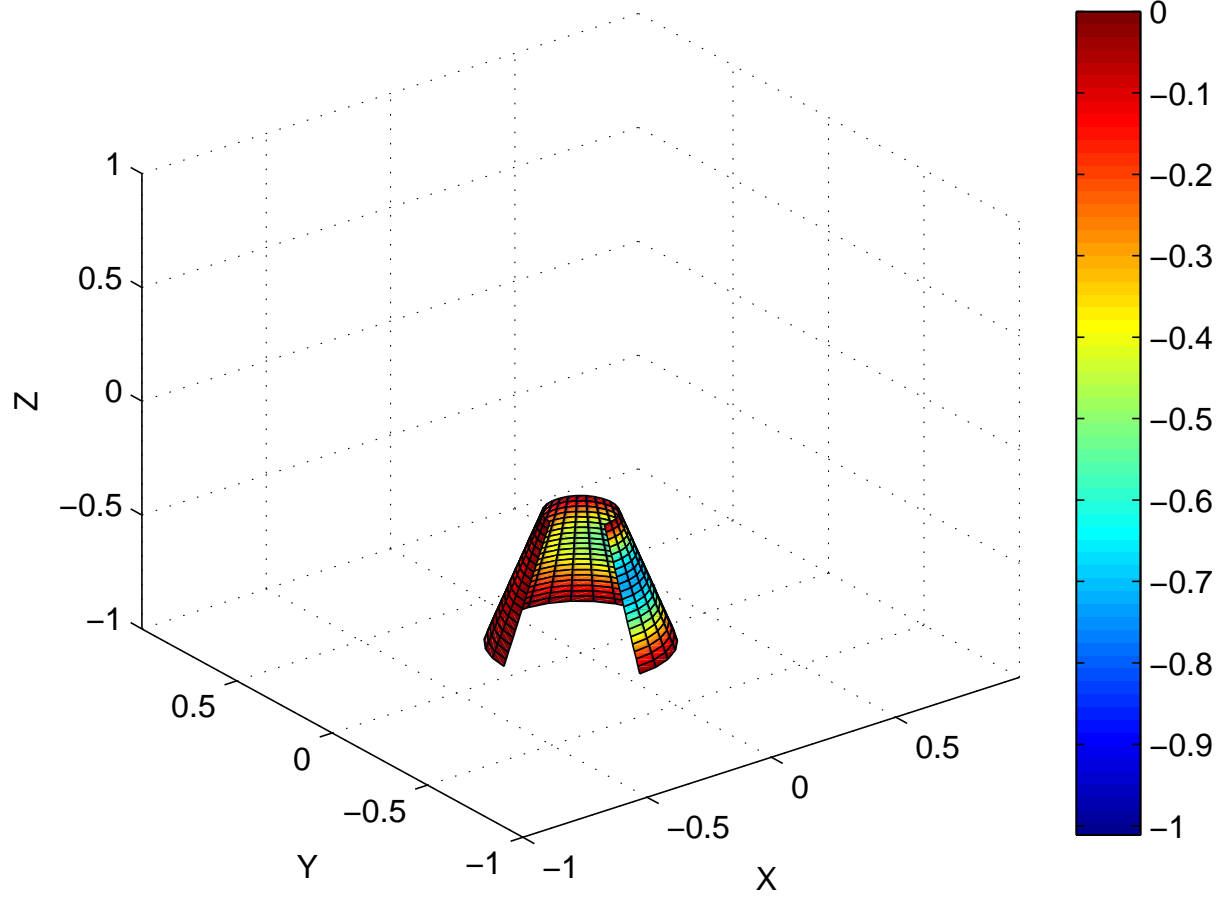
T = 25,  P2 = 1.2566
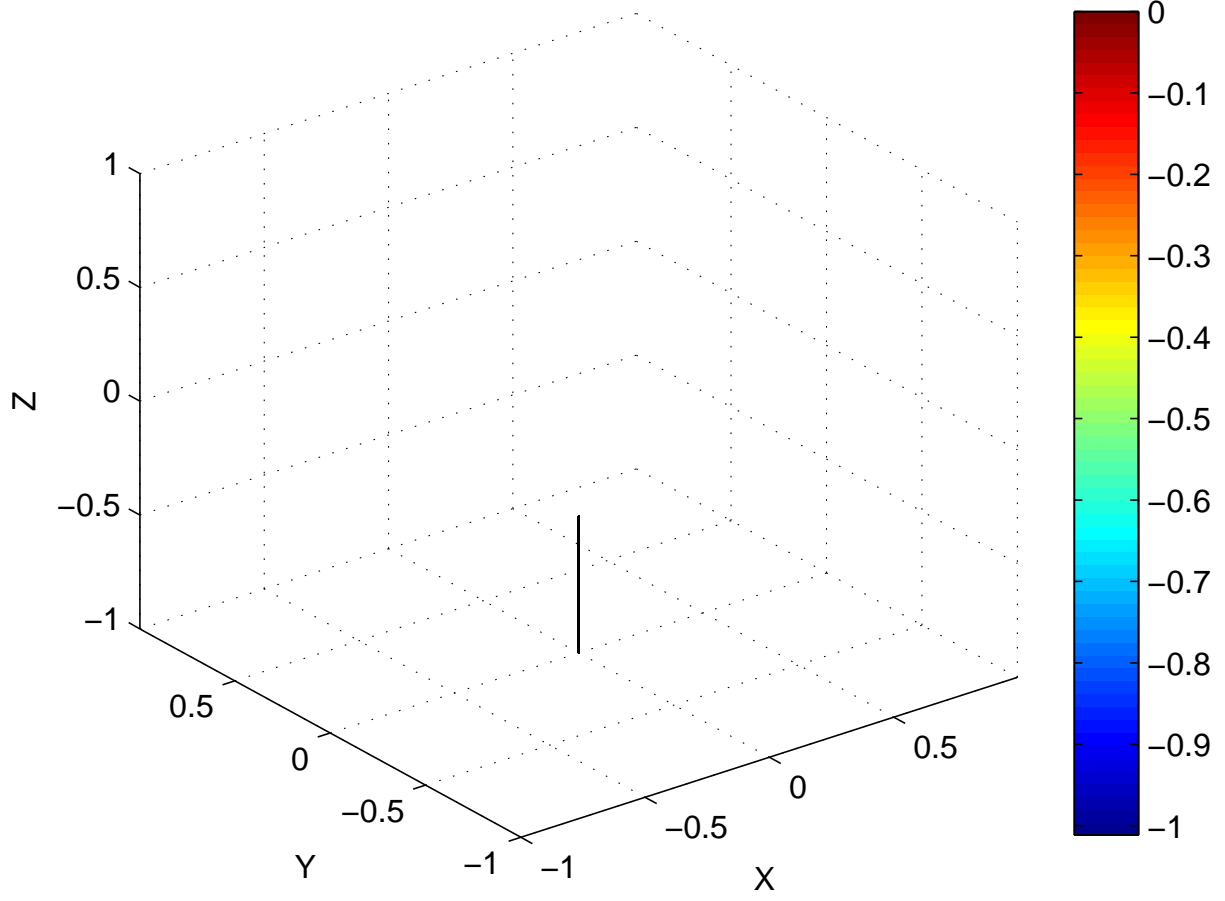
T = 25, P2 = 1.5708
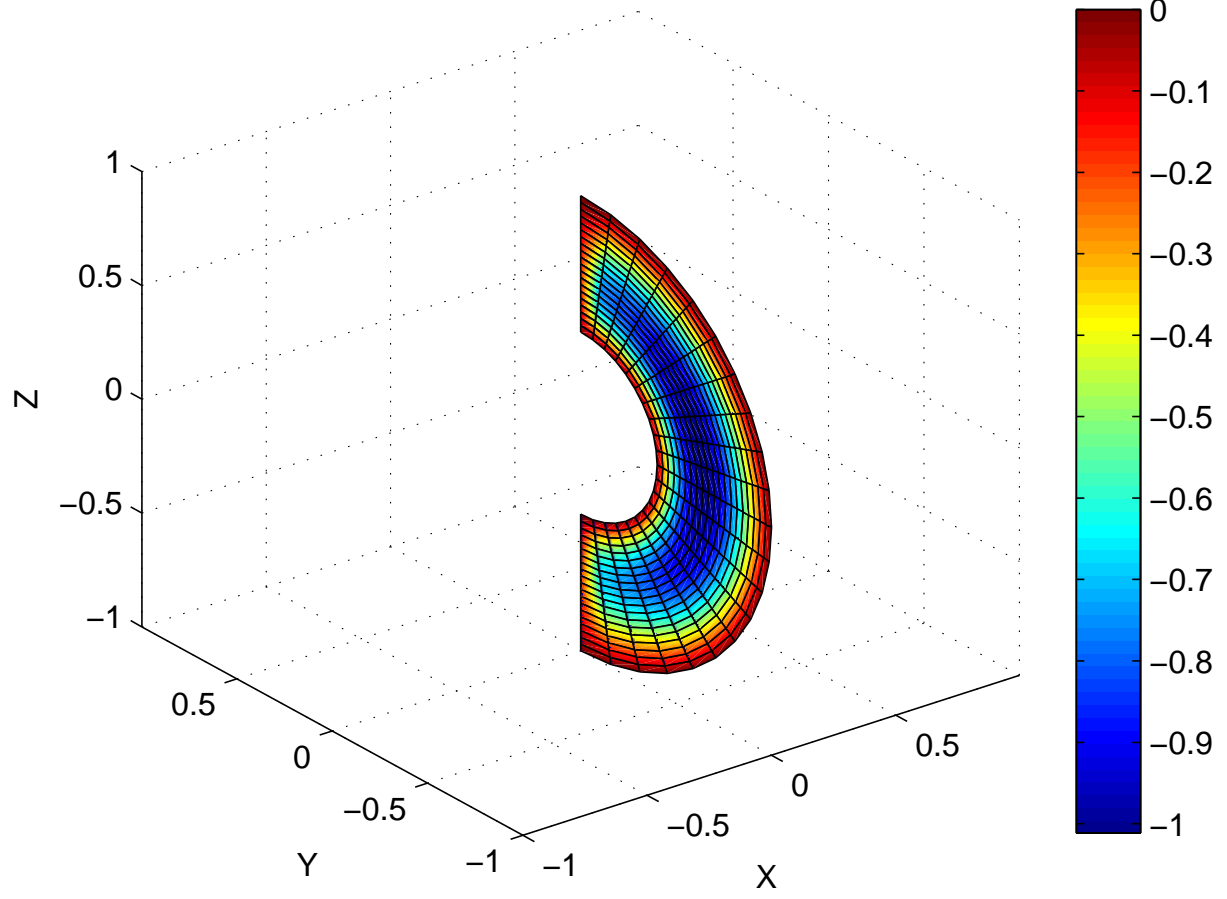
18

T = 25,  P2 = 1.885
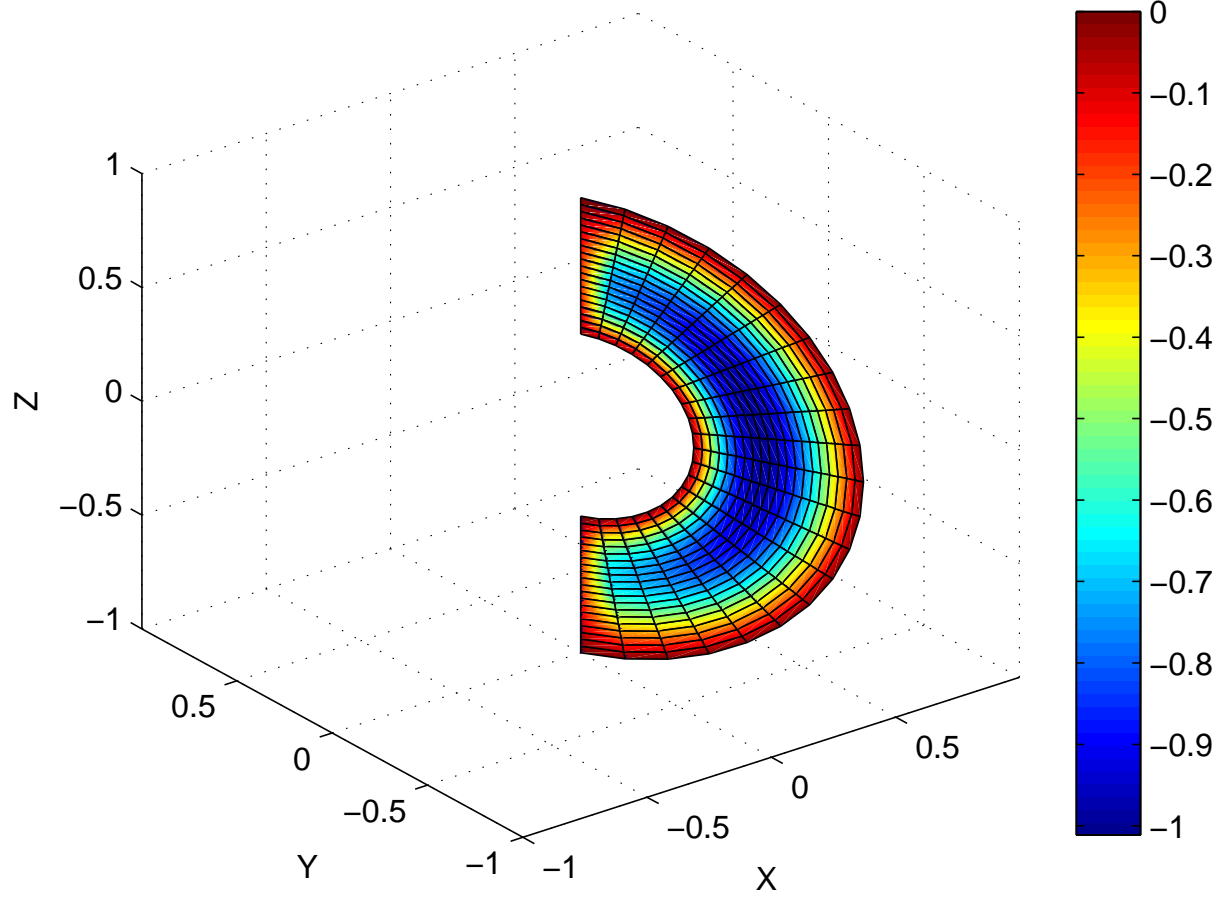
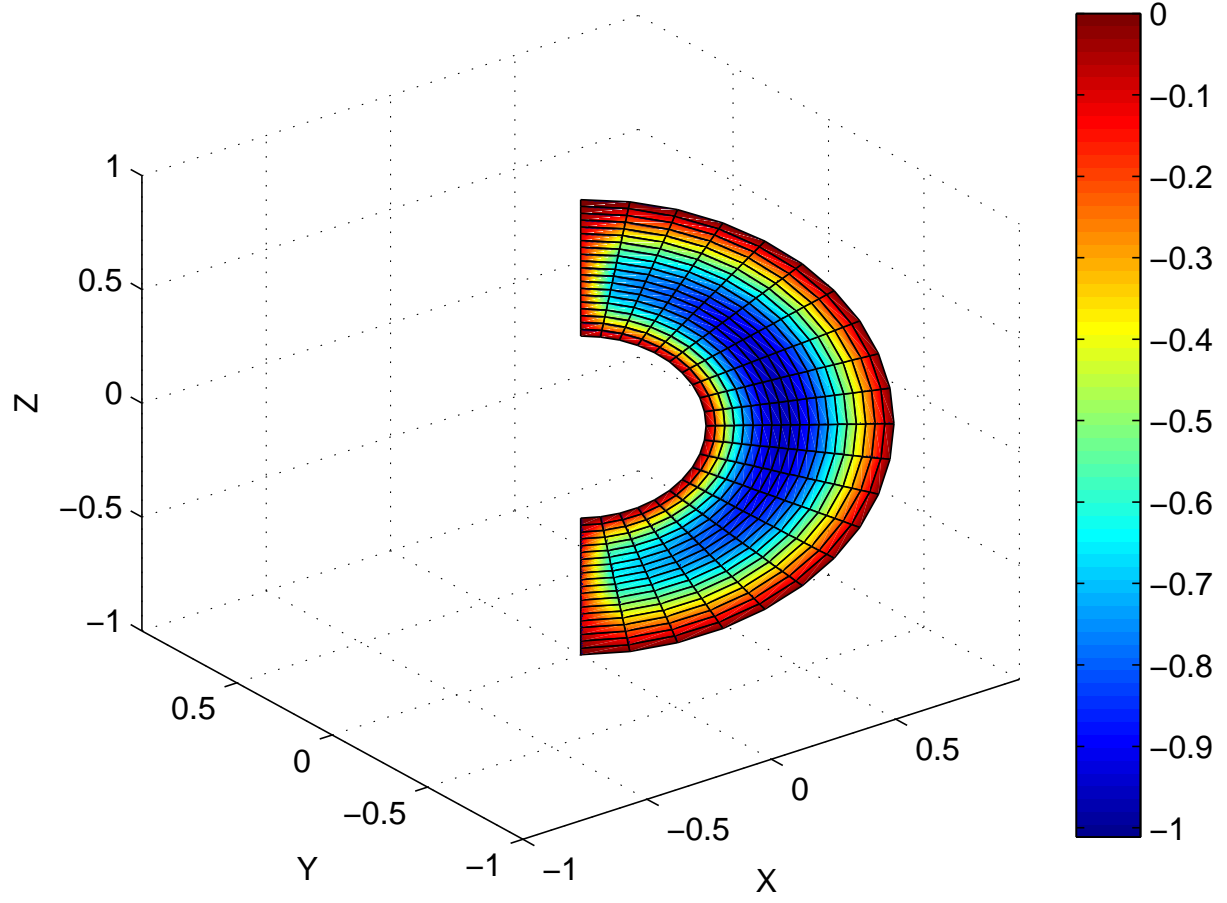T = 25,  P2 = 2.1991

T = 25,  P2 = 2.5133

21

T = 25,  P2 = 2.8274
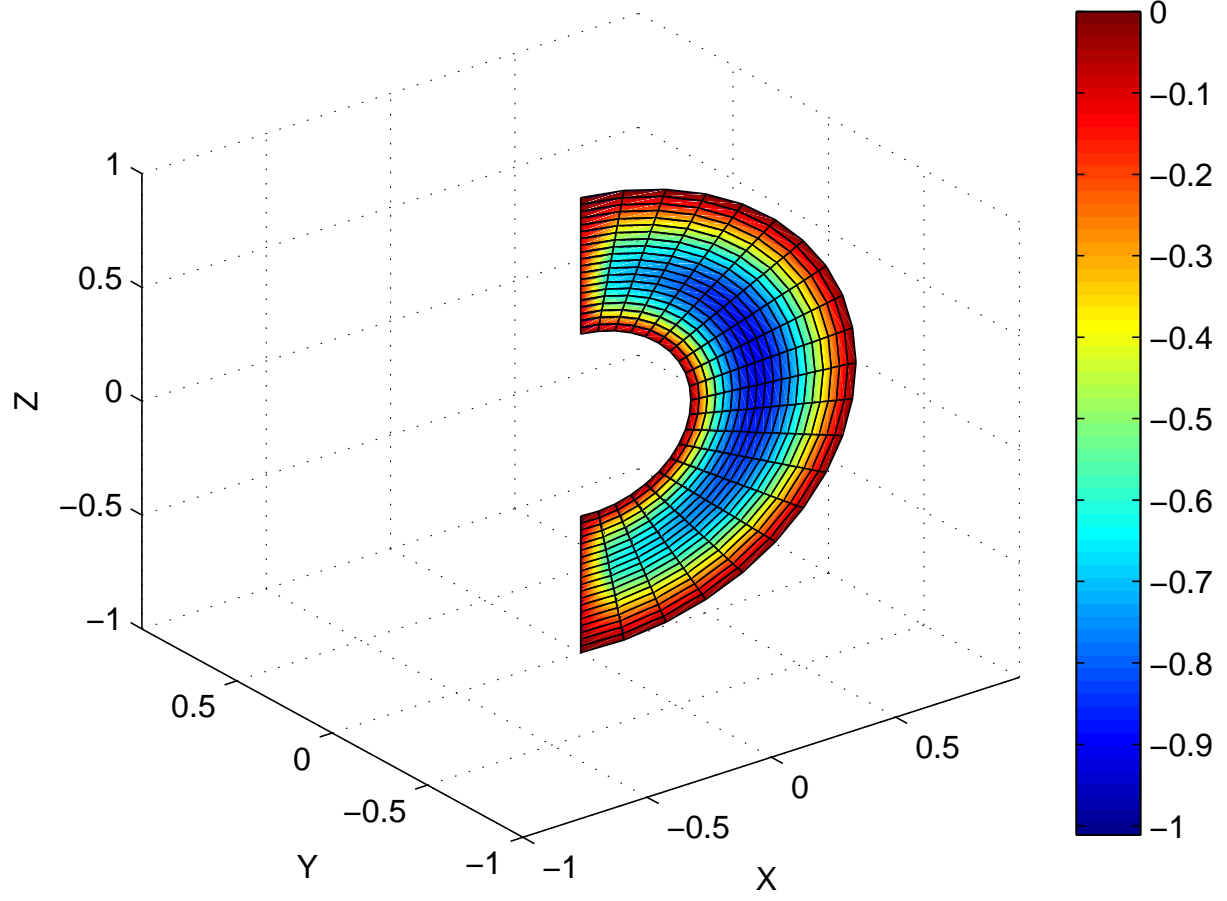
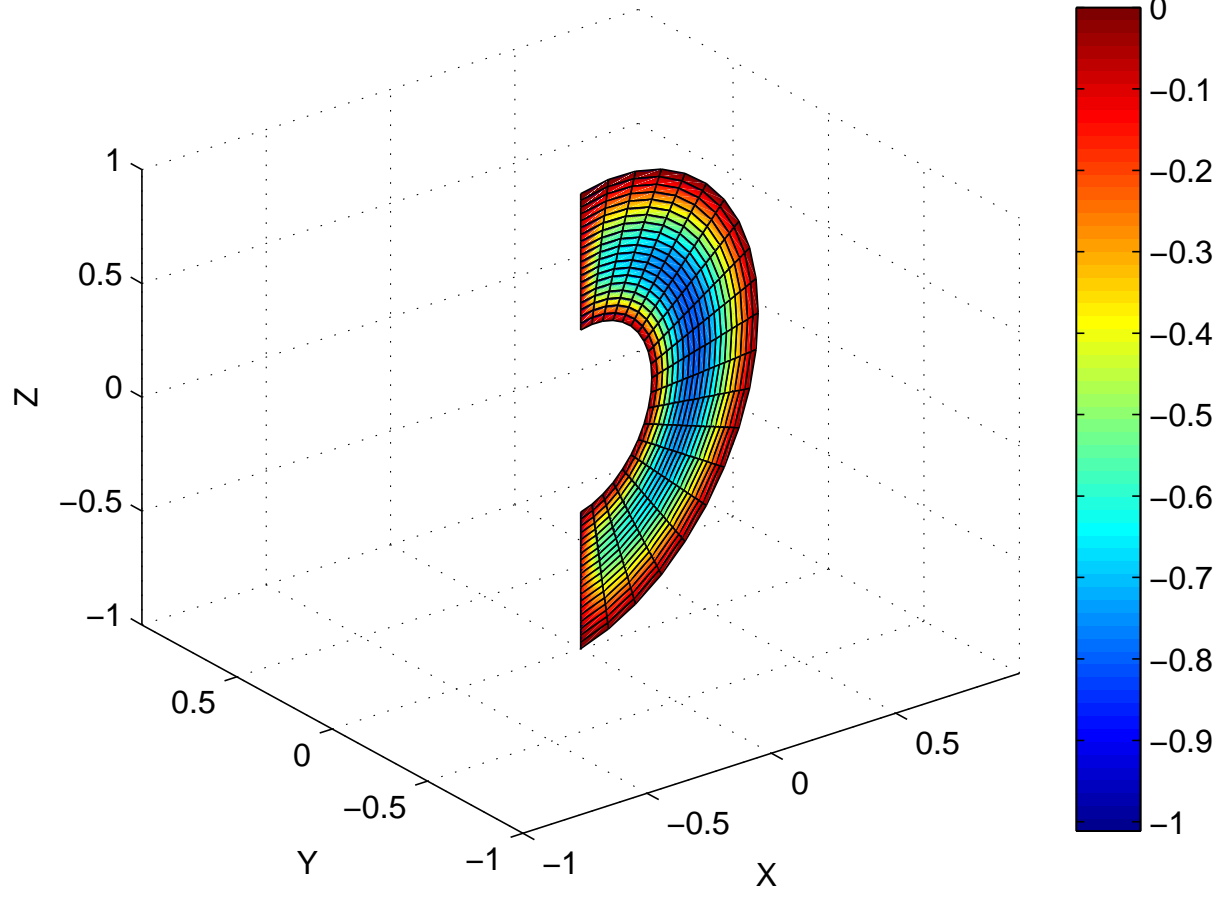T = 25,  P2 = 3.1416

23

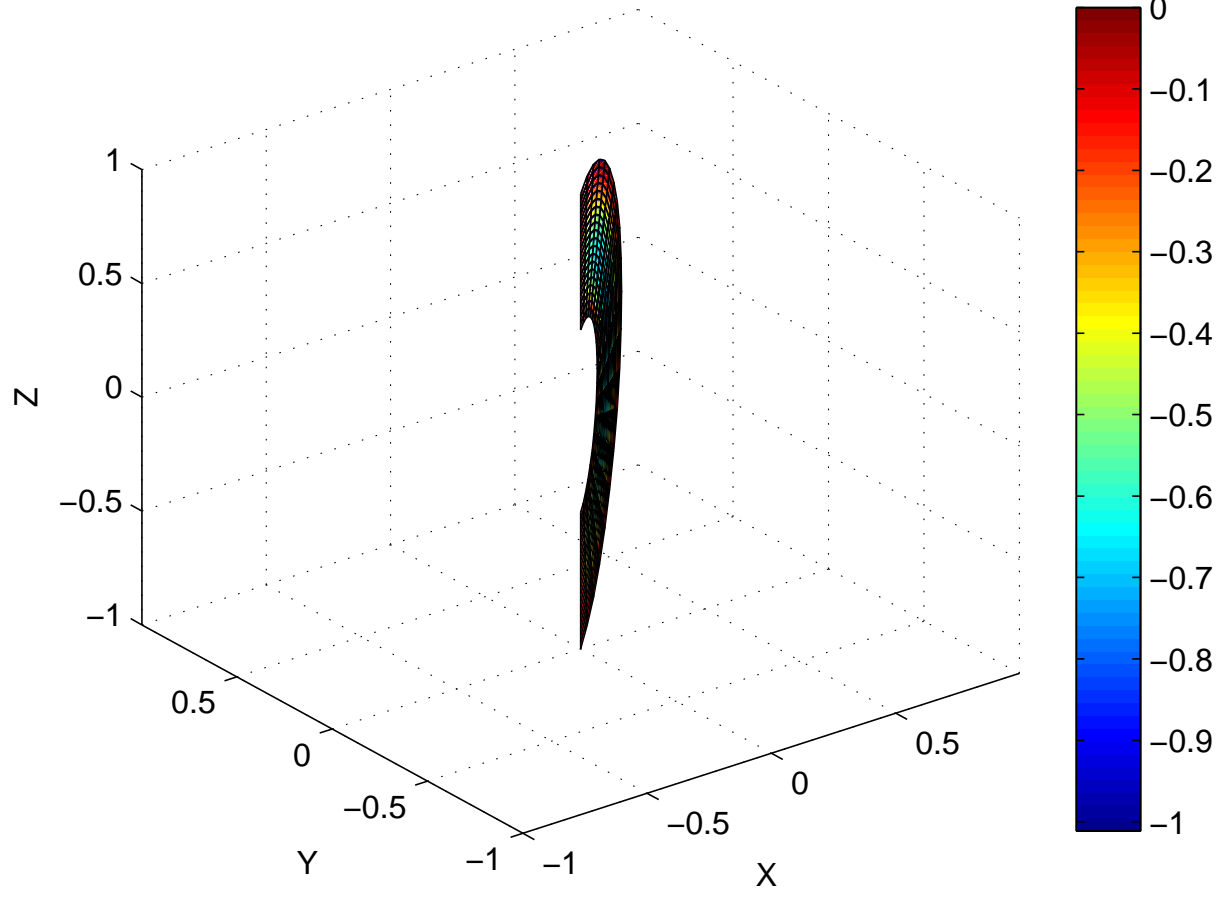T = 25, P3 = −1.5708
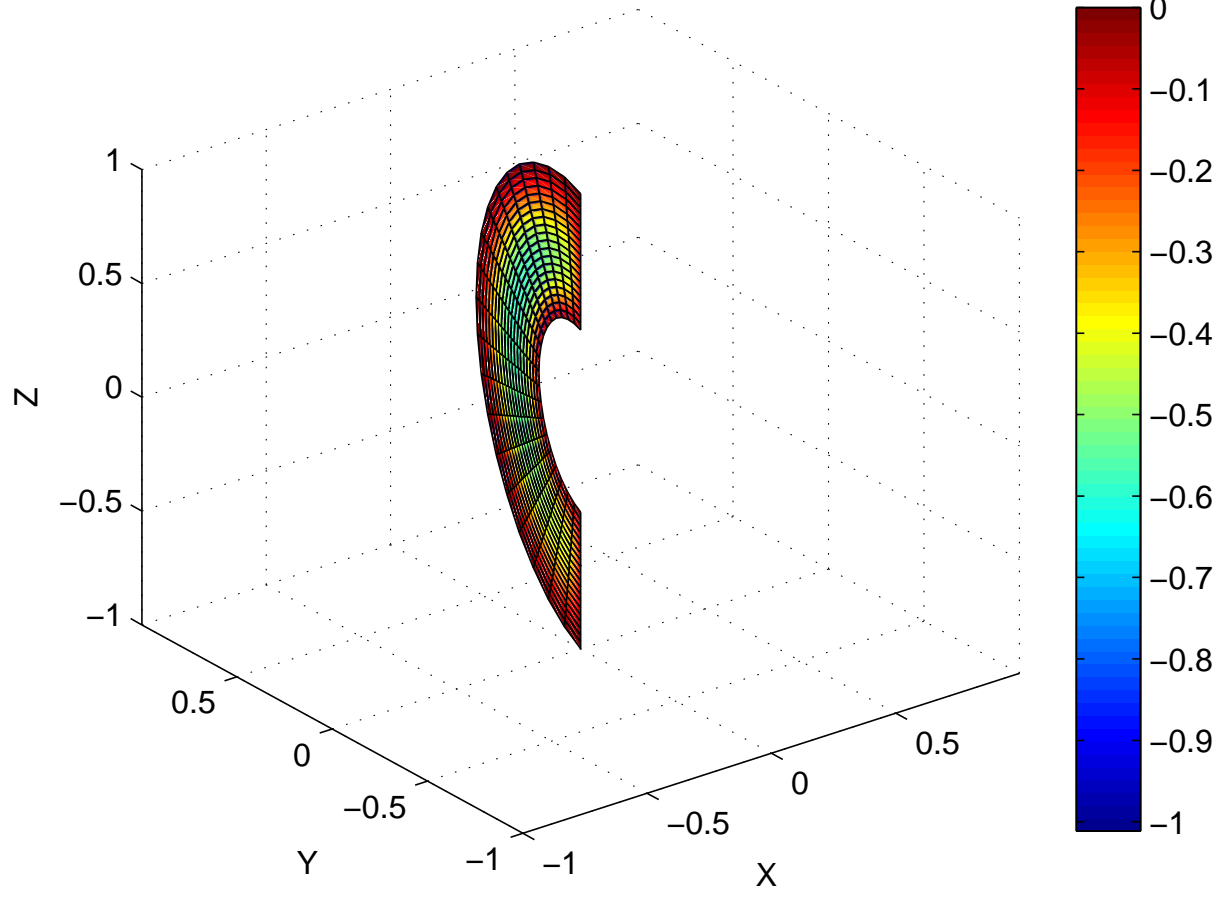
T = 25, P3 = −1.0996

T = 25, P3 = −0.62832

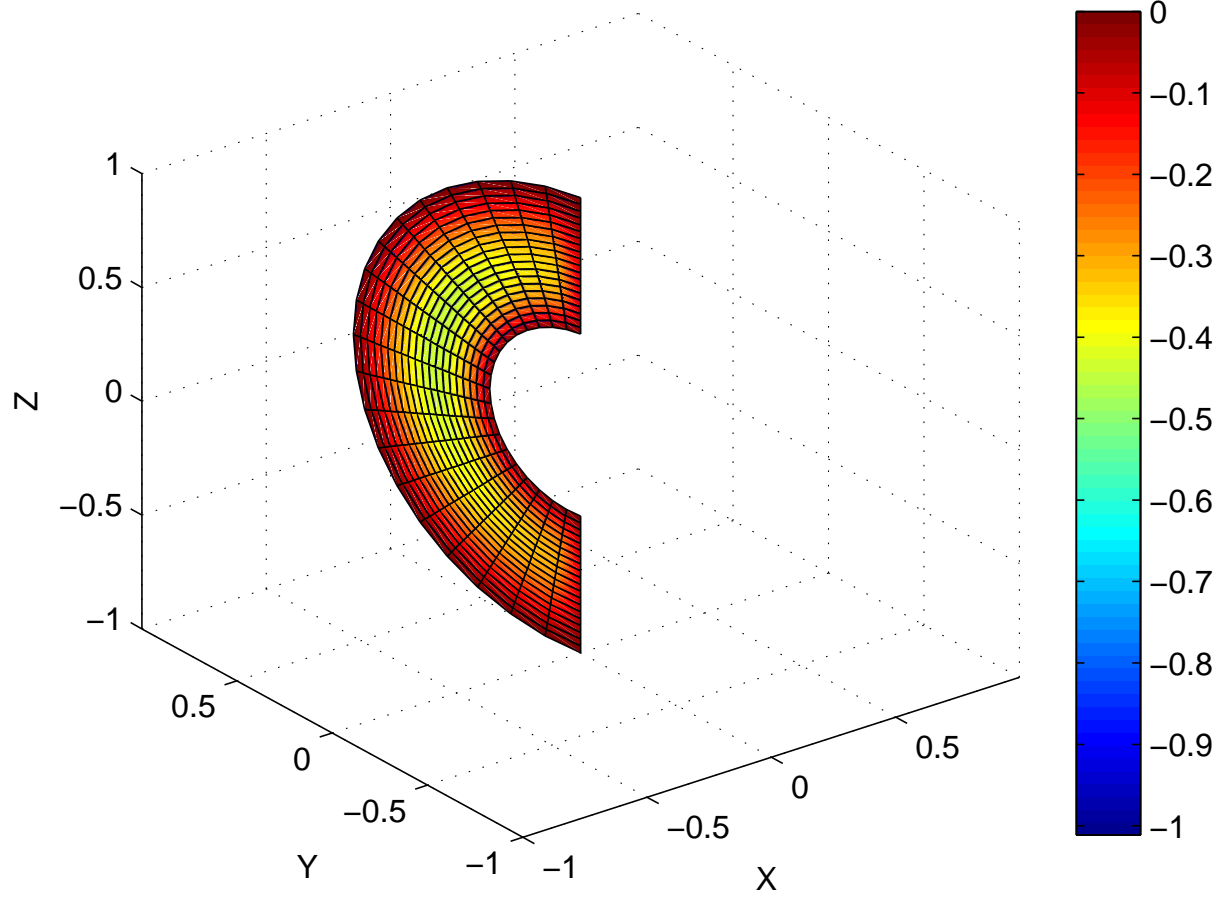T = 25, P3 = −0.15708

T = 25,  P3 = 0.31416

T = 25,  P3 = 0.7854

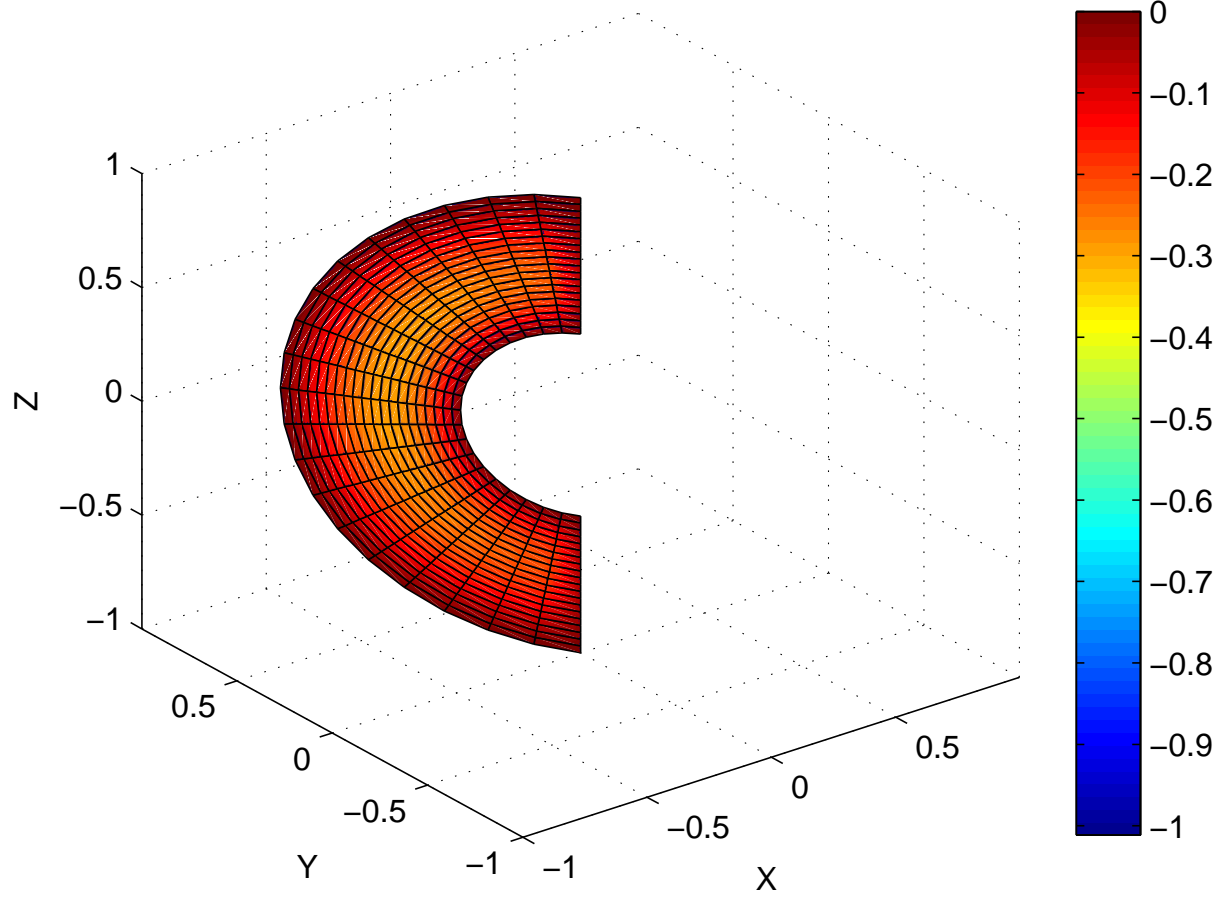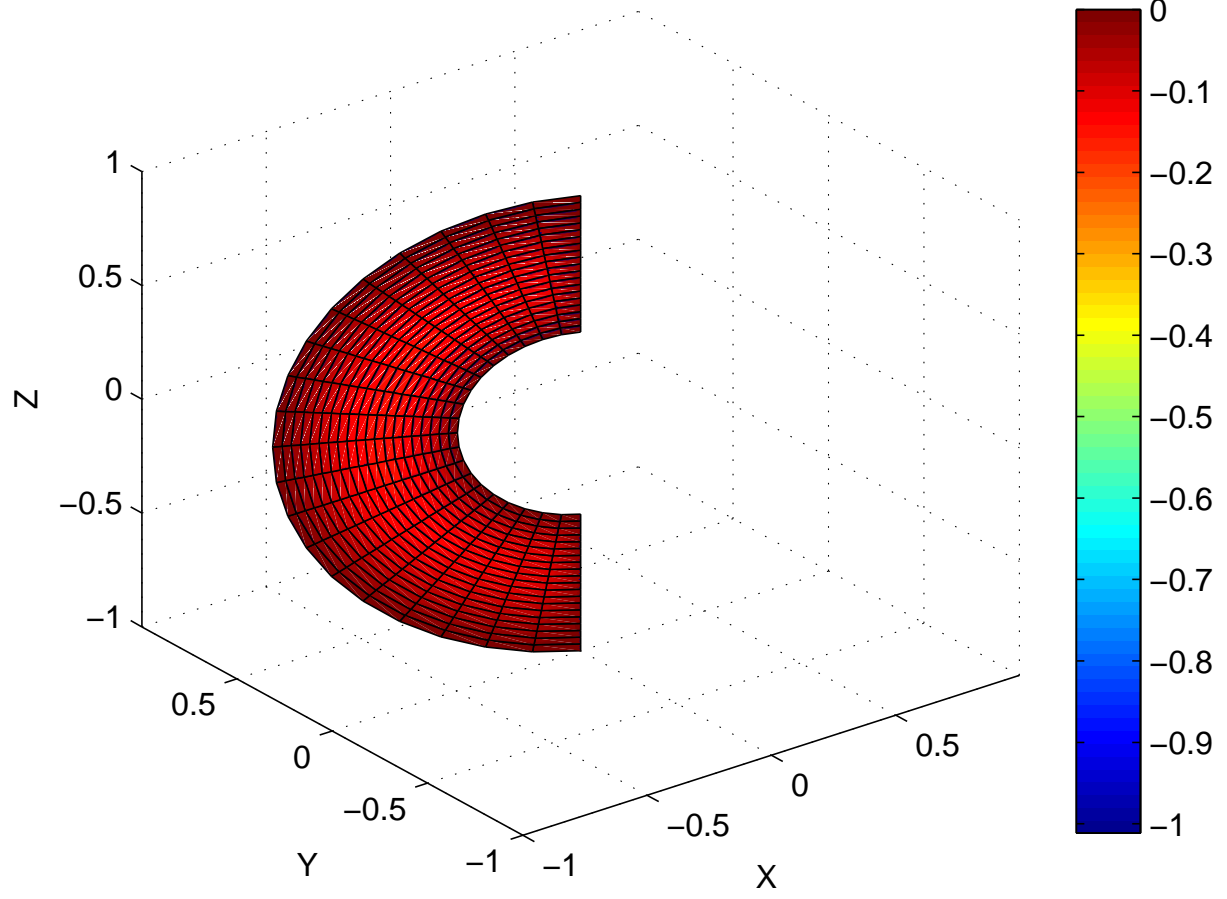T = 25,  P3 = 1.2566

T = 25,  P3 = 1.7279

31

T = 25,  P3 = 2.1991

T = 25, P3 = 2.6704

T = 25,  P3 = 3.1416