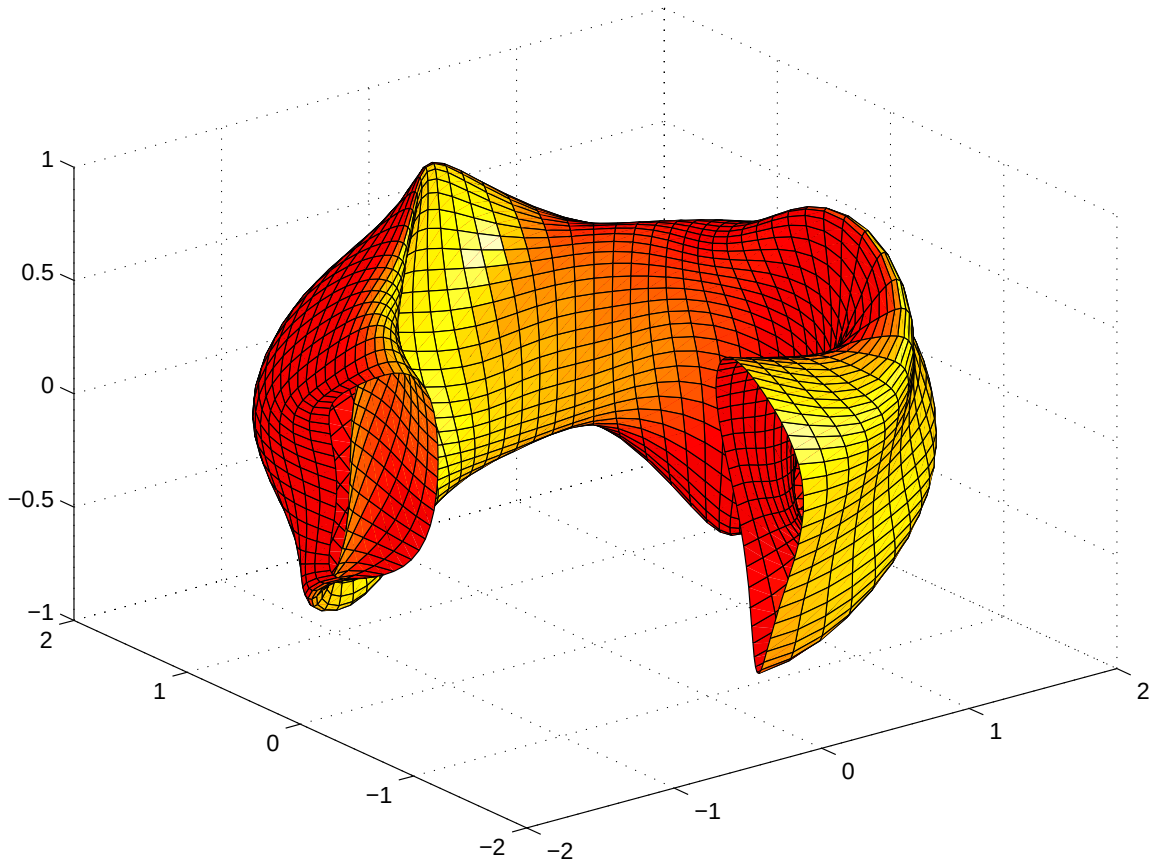
MHD Simulation of Stellarators with M3D

H. Strauss, NYU
W. Park, X. Tang, G. Y. Fu, PPPL
L. Sugiyama, MIT

M3D - Code

- I. Multi level physics models
  - A. MHD
  - B. neoclassical
  - C. two - fluid
  - D. kinetic effects
- II. Geometry, Grid, Discretiztion
  - A. Finite difference & 2D spectral
  - B. 2D Finite volume & 1D spectral
  - C. 2D Finite volume & 1D Finite difference
- III. Parallelization
  - A. Shared Memory
  - B. Distributed Memory

M3D - Stellarator Simulations


1
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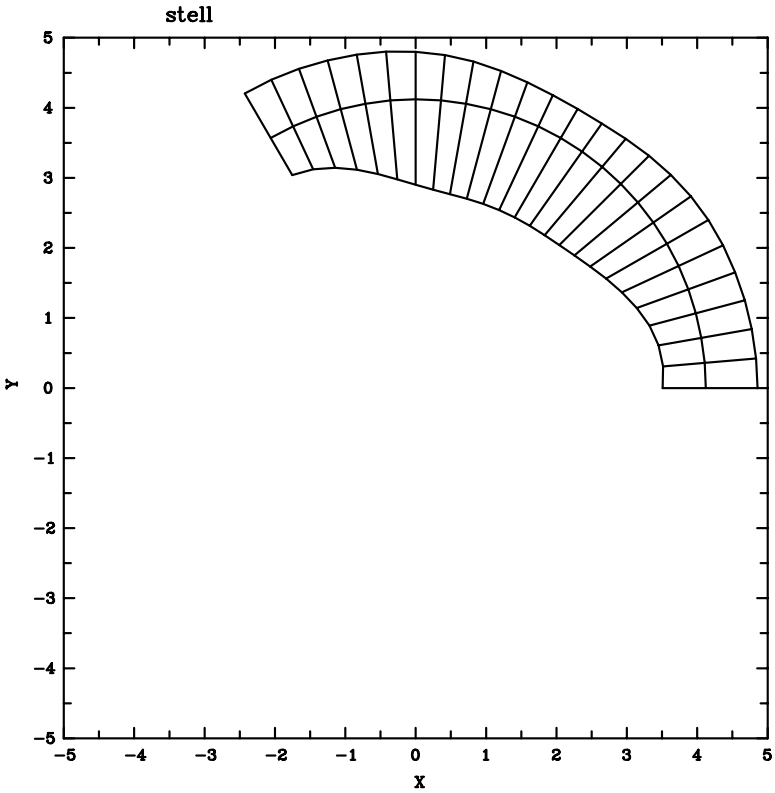
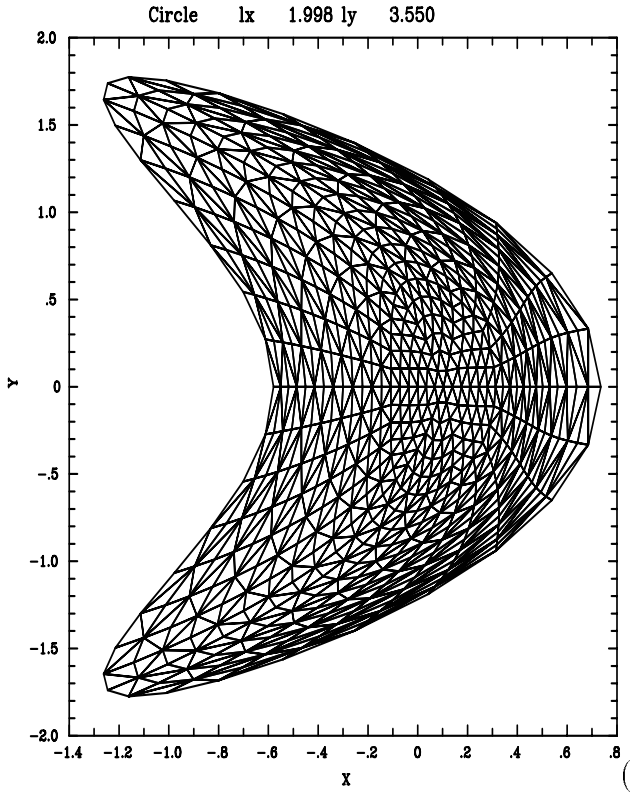
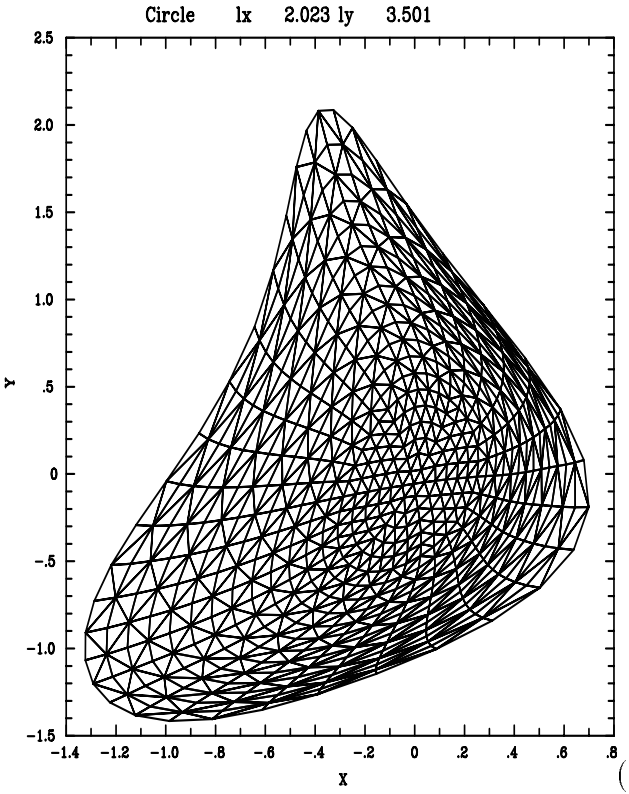
0
−0.5
−1
2
1
0
−1
−2
−2
−1
0
1
2





(a)



(b)

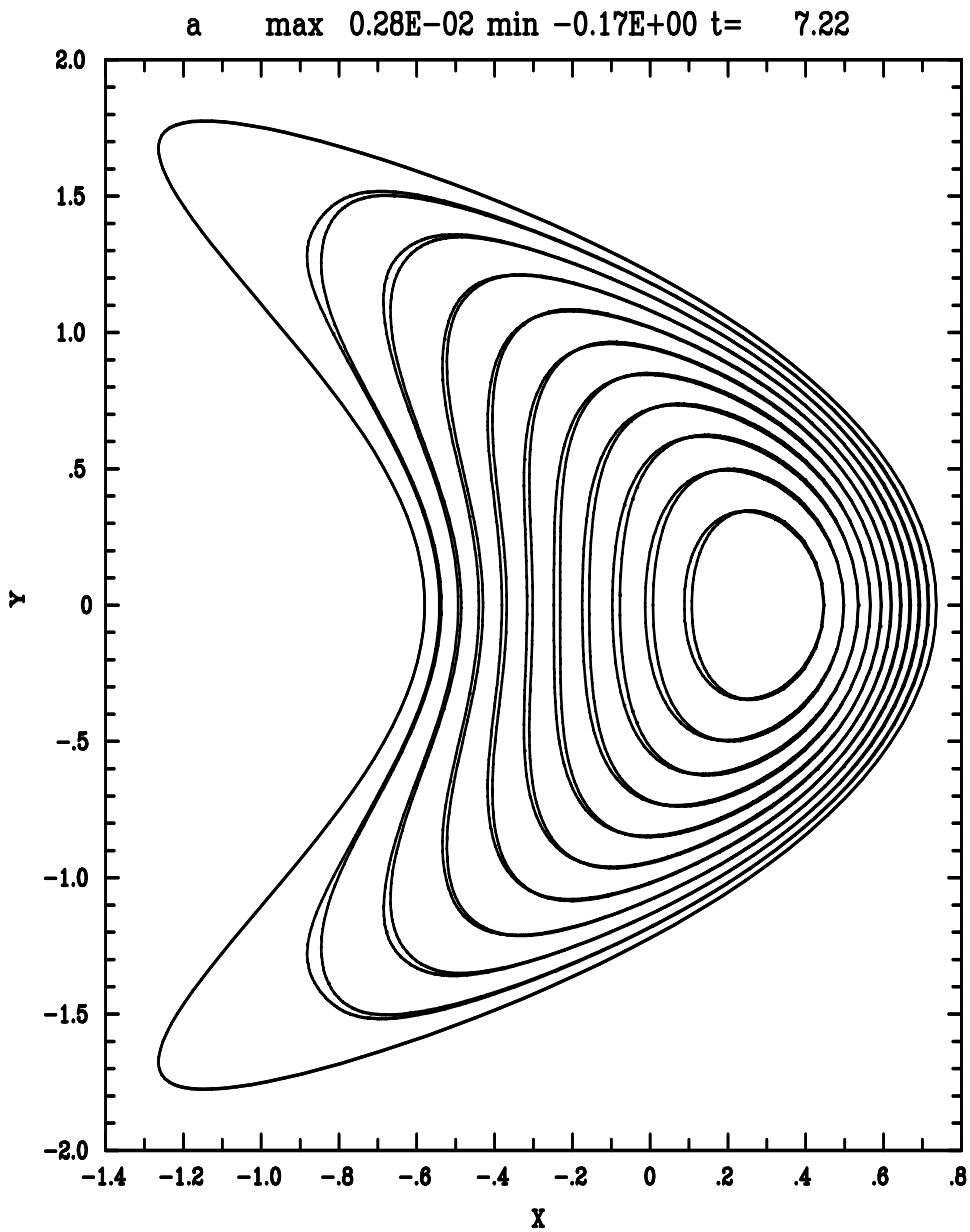
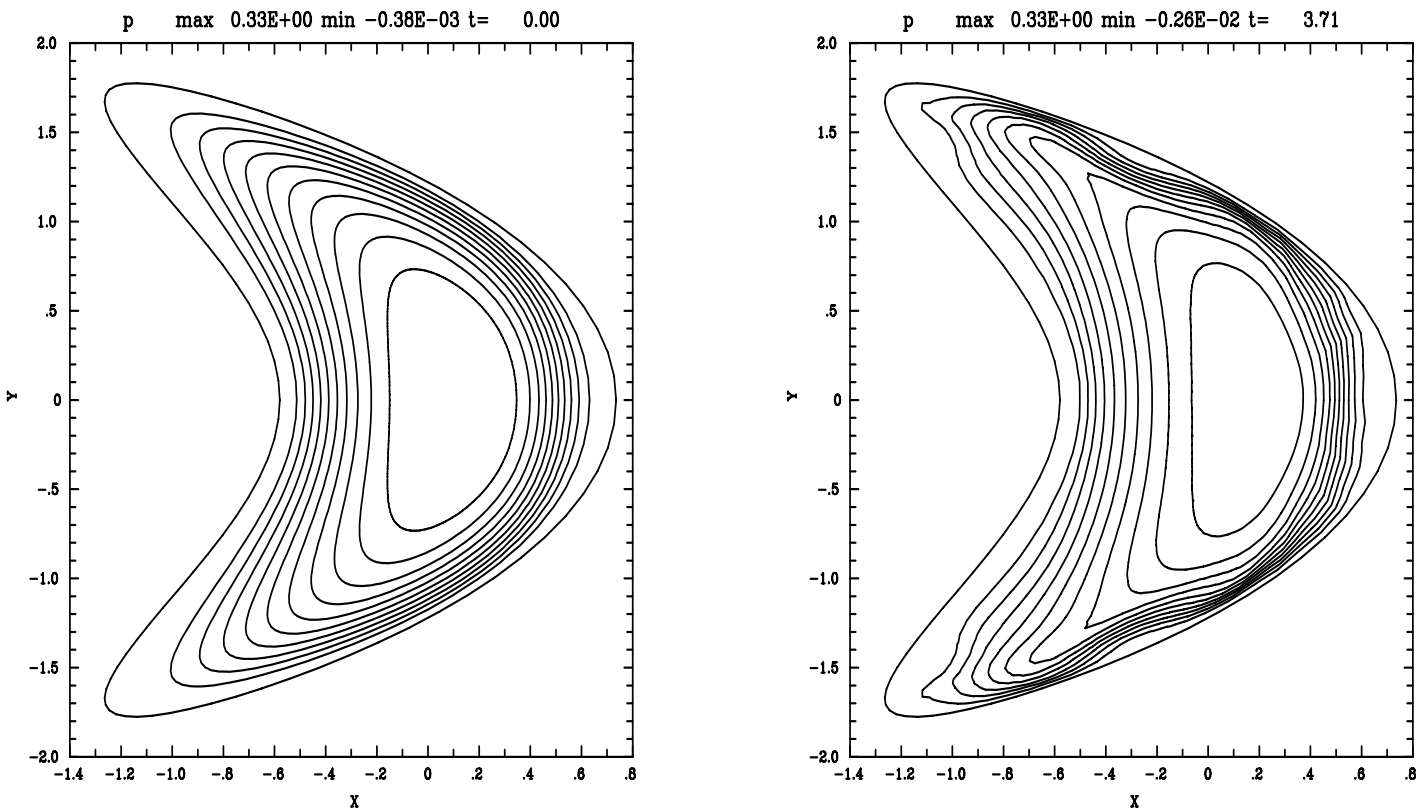


Figure 1: Contours of poloidal flux ψ at $t = 0$ and $t = 7$.



(a) (b)

Figure 1: Contours of pressure at $\phi = 0$, at (a) $t = 0$, (b) $t = 3$, for an unstable case with 1.5 the pressure.

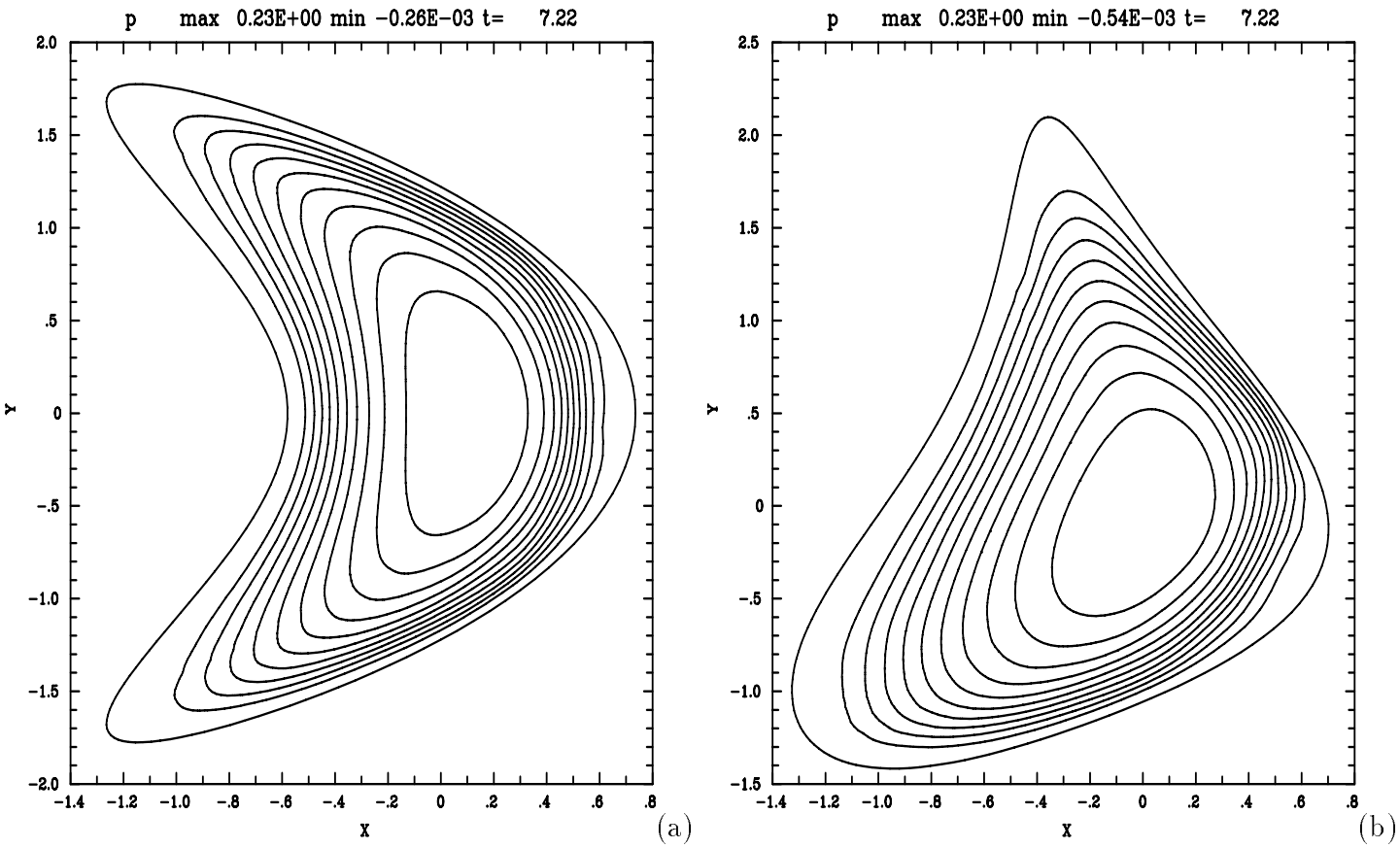


Figure 2: Contours of pressure at (a) $\phi = 0$, (b) $\phi = \pi/6$, at $t = 7$.

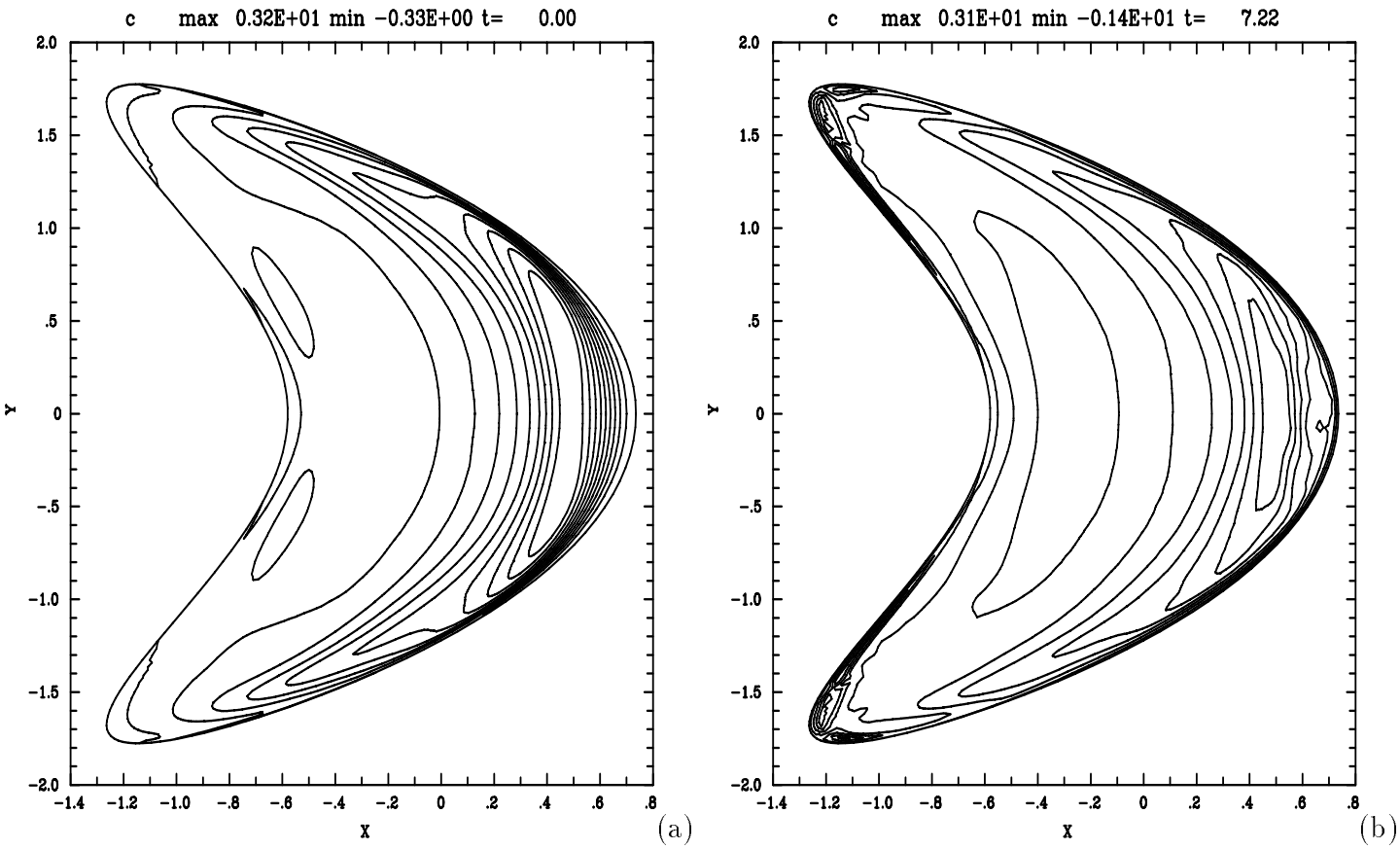


Figure 1: Contours of toroidal at $\phi = 0$ (a) $t = 0$, (b) $t = 7$.

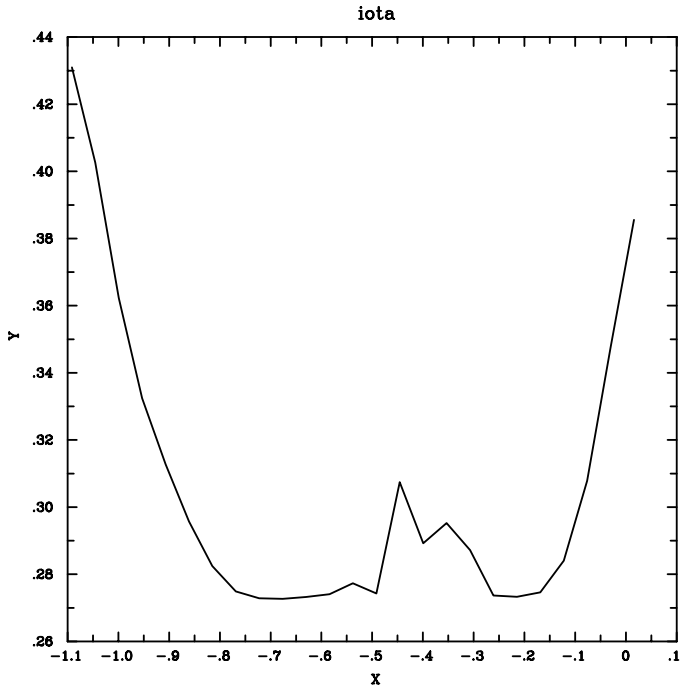


Figure 1: transform ι at $t = 0$.

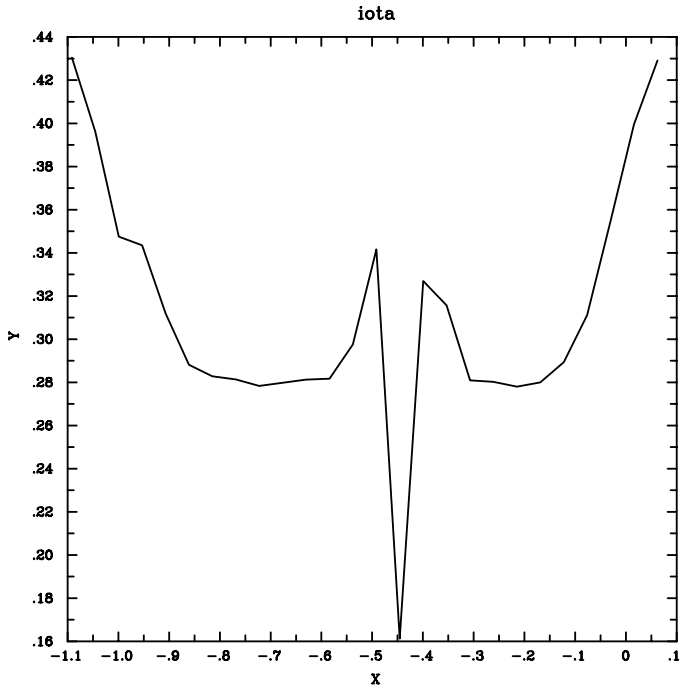


Figure 2: transform ι at $t = 7$.

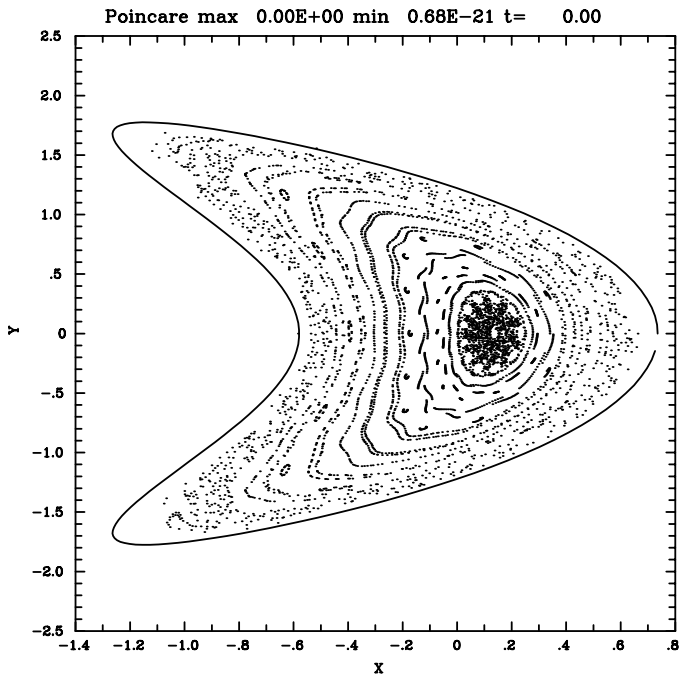


Figure 1: Poincare plot at $t = 0$.

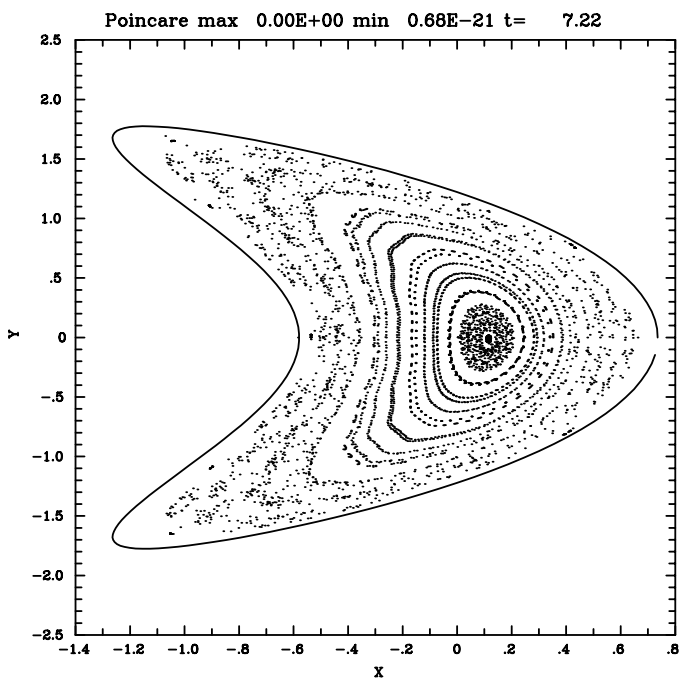


Figure 2: Poincare plot at $t = 7$.

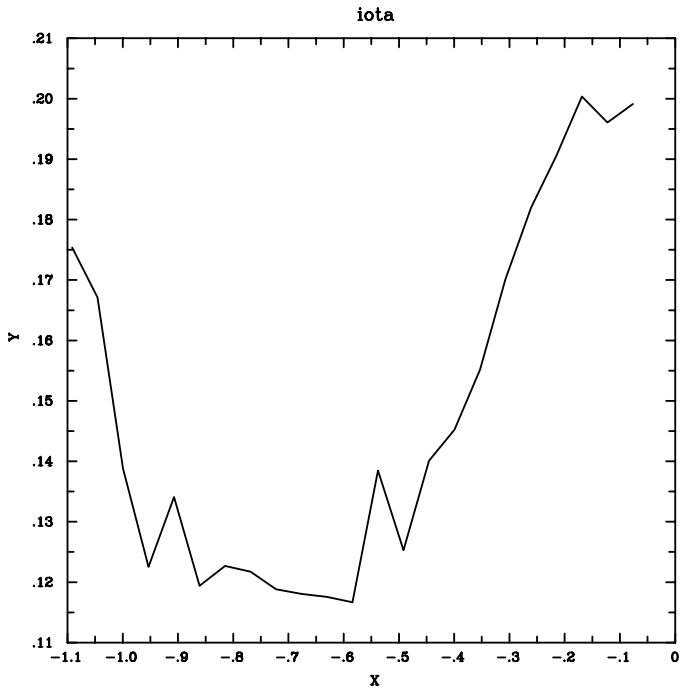


Figure 1: transform ι of vacuum field.

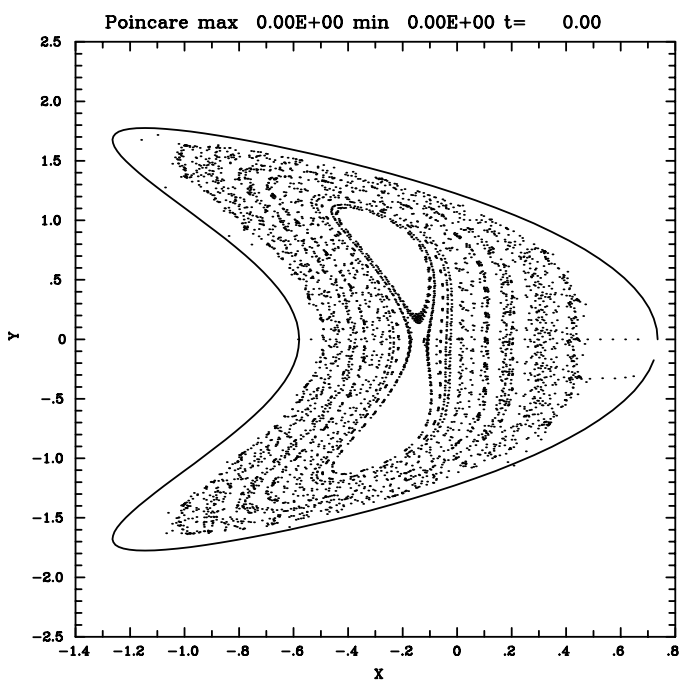


Figure 2: Poincare plot of vacuum field.