ATMS 502: Numerical Fluid Dynamics
Programming Assignment 6

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1 3D nonlinear, quasi compressible flow

θ' field - Initial

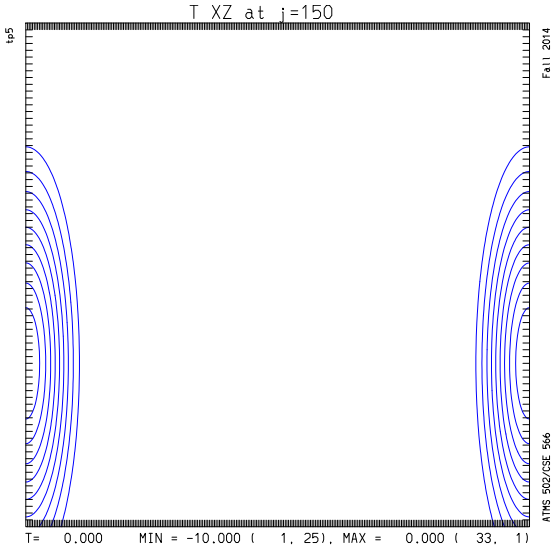


Figure 1.1: Initial θ'

v field - Initial

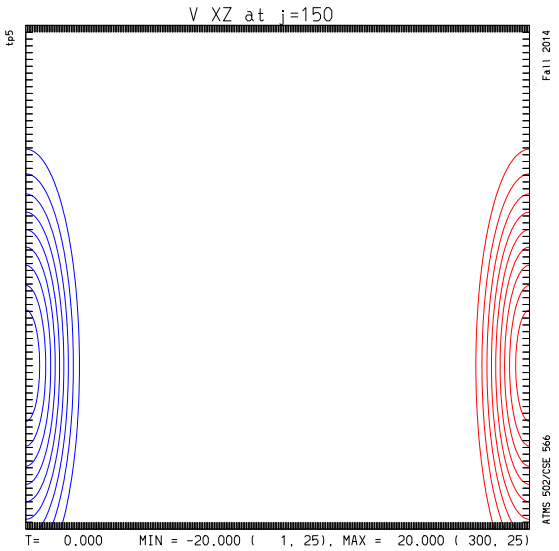


Figure 1.2: Initial x-y section of v

Plots at $T = 750$s

θ' field

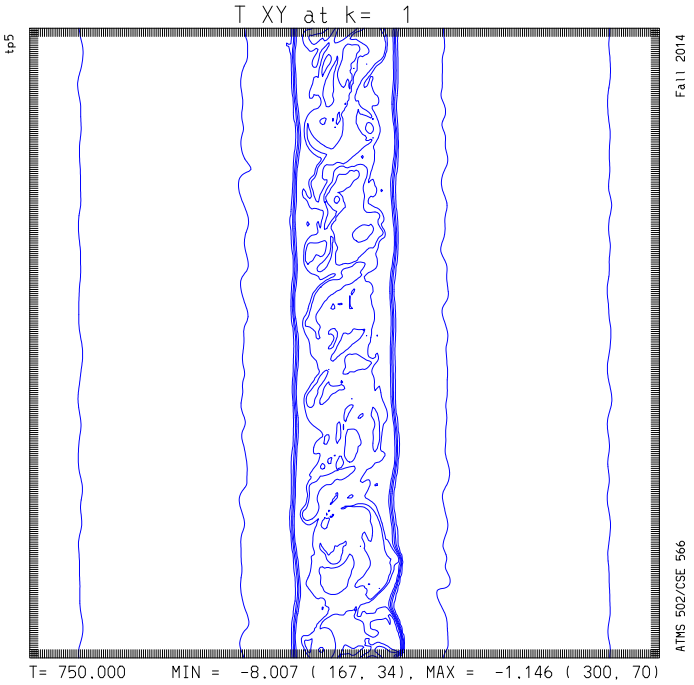


Figure 1.3: Final x-y section of θ'

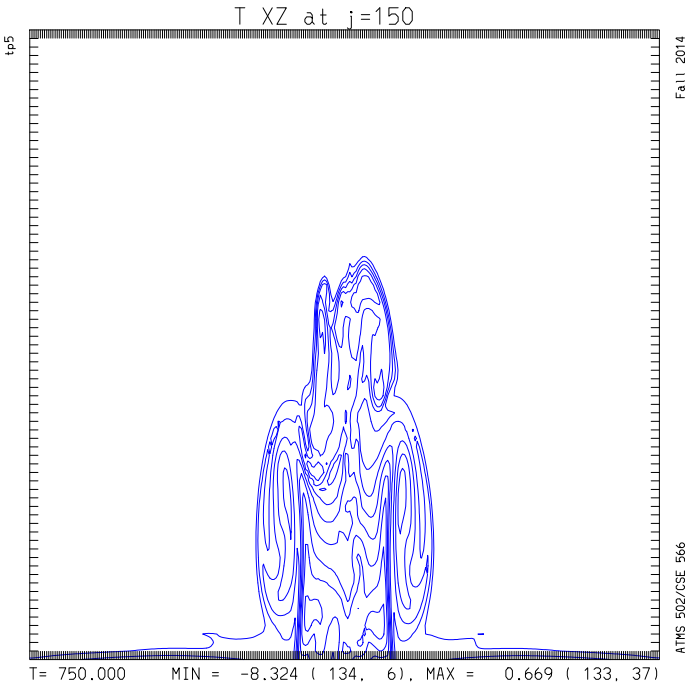


Figure 1.4: Final x-z section of θ'

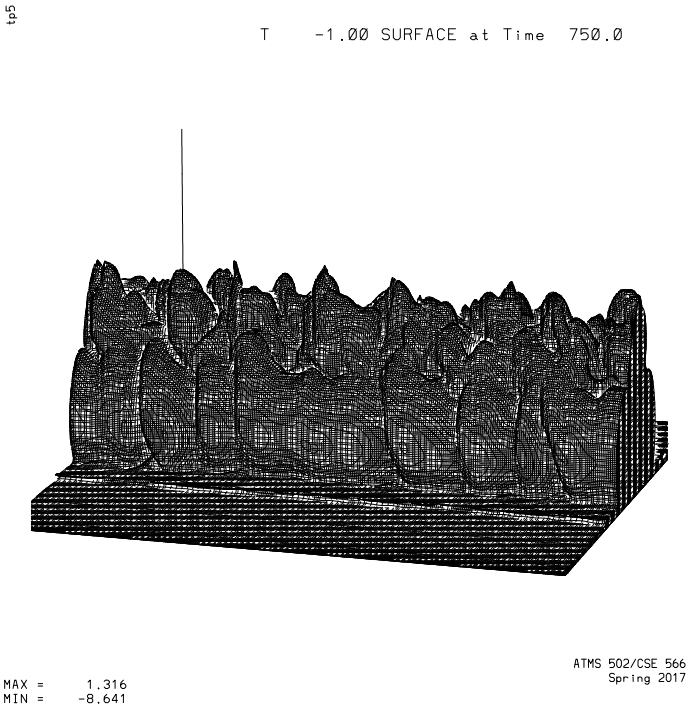


Figure 1.5: Final surface of θ'

w field

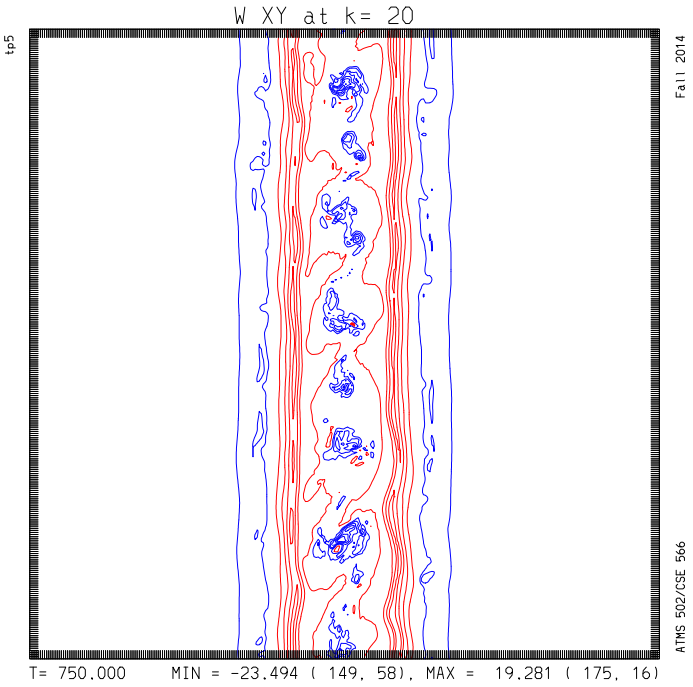


Figure 1.6: Final x-y section of w

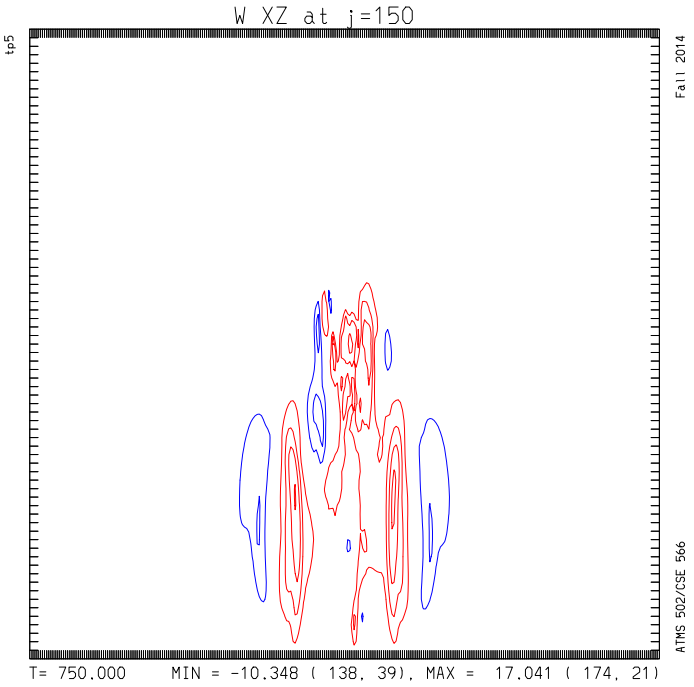


Figure 1.7: Final x-z section of w

u field

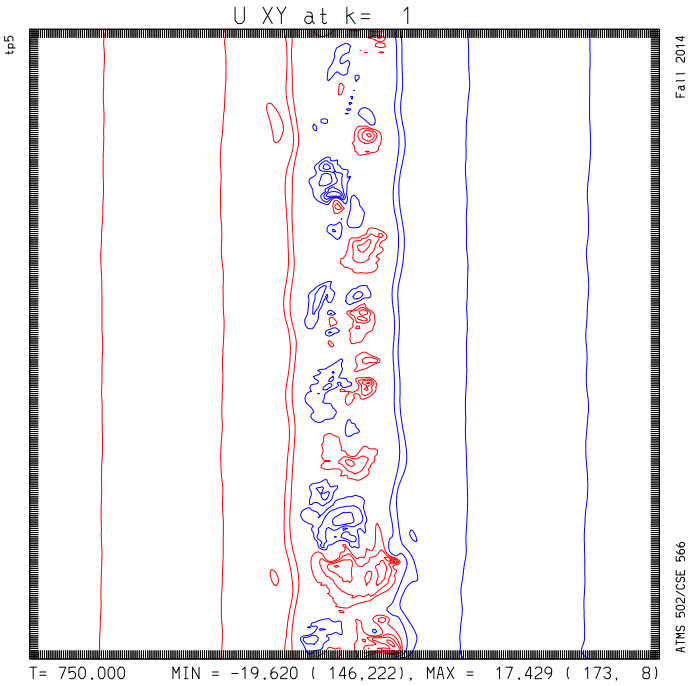


Figure 1.8: Final x-y section of u

v field

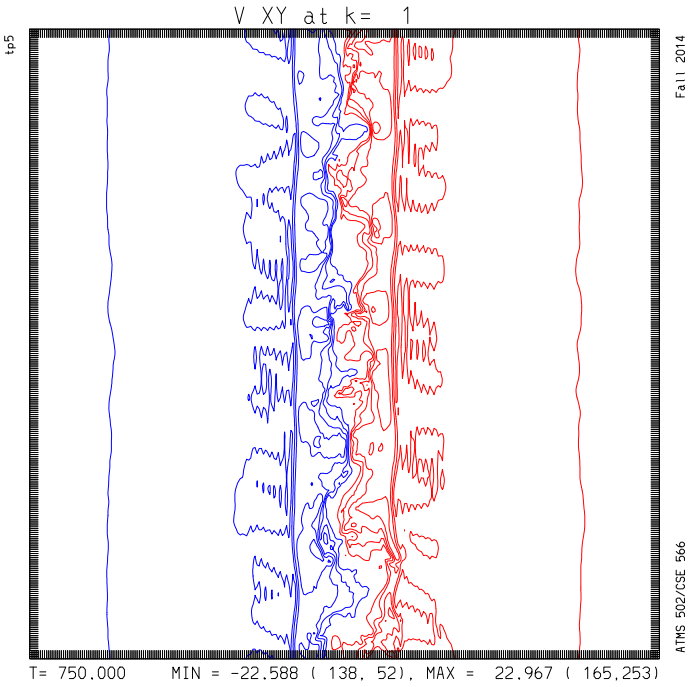


Figure 1.9: Final x-y section of v

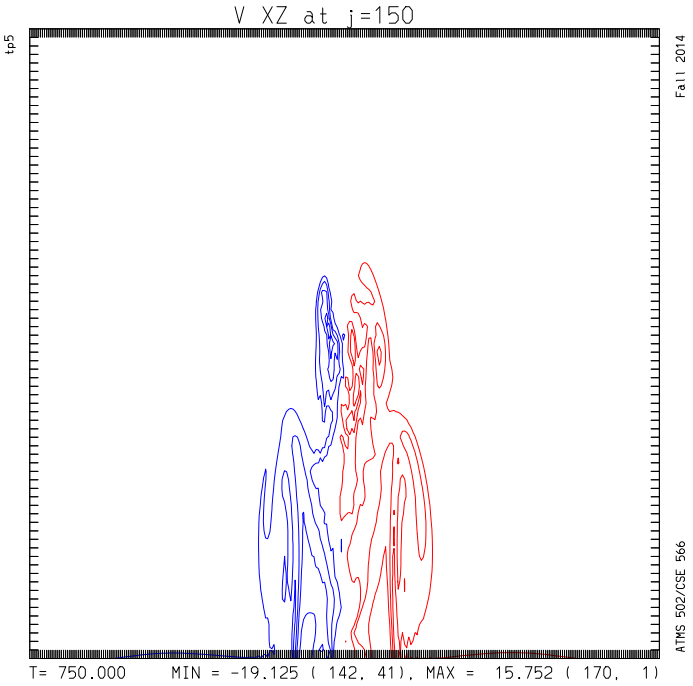


Figure 1.10: Final x-z section of v

Vorticity field

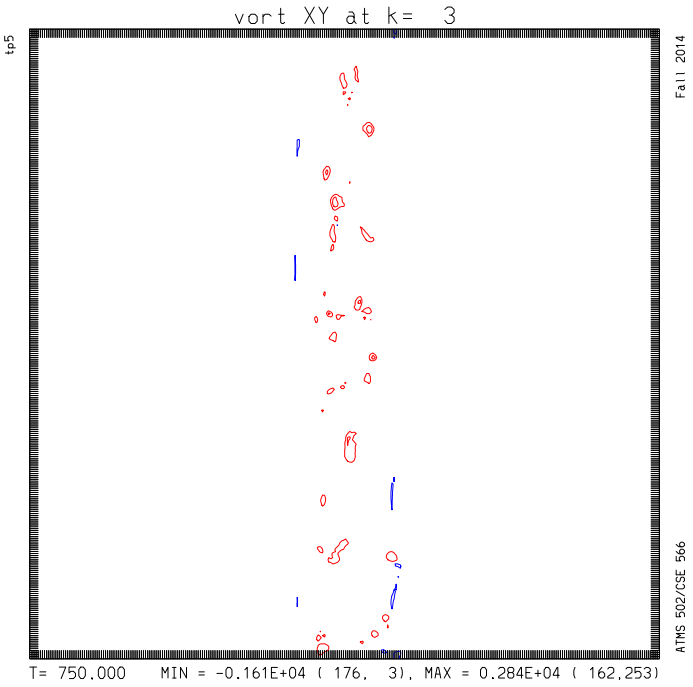


Figure 1.11: Final x-y section of vertical vorticity

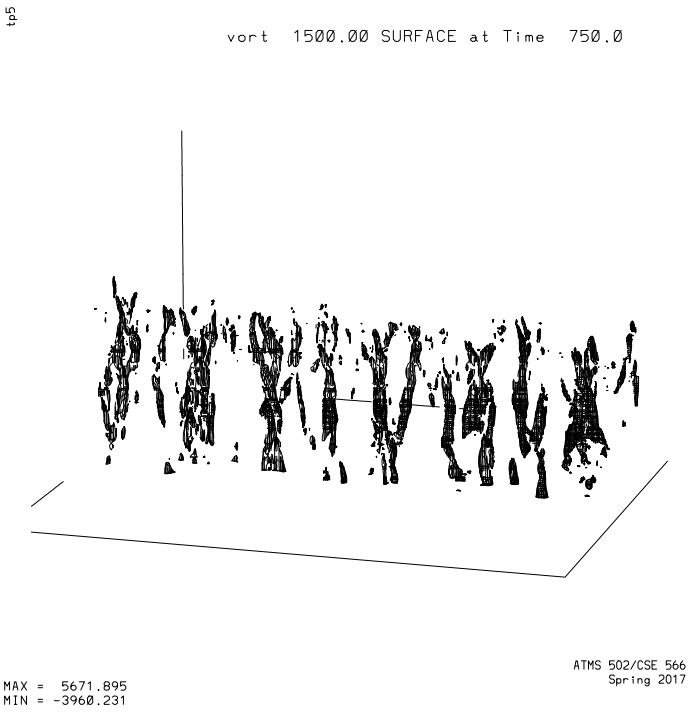


Figure 1.12: Final surface of vertical vorticity

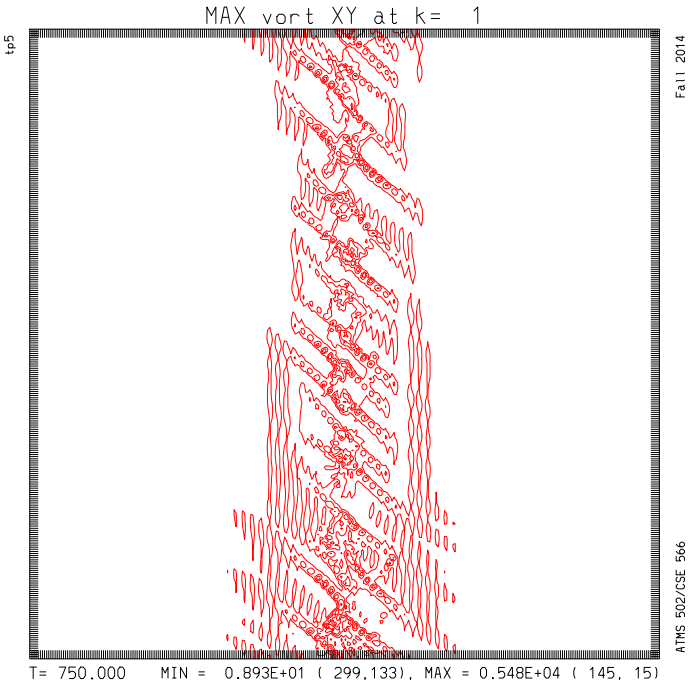
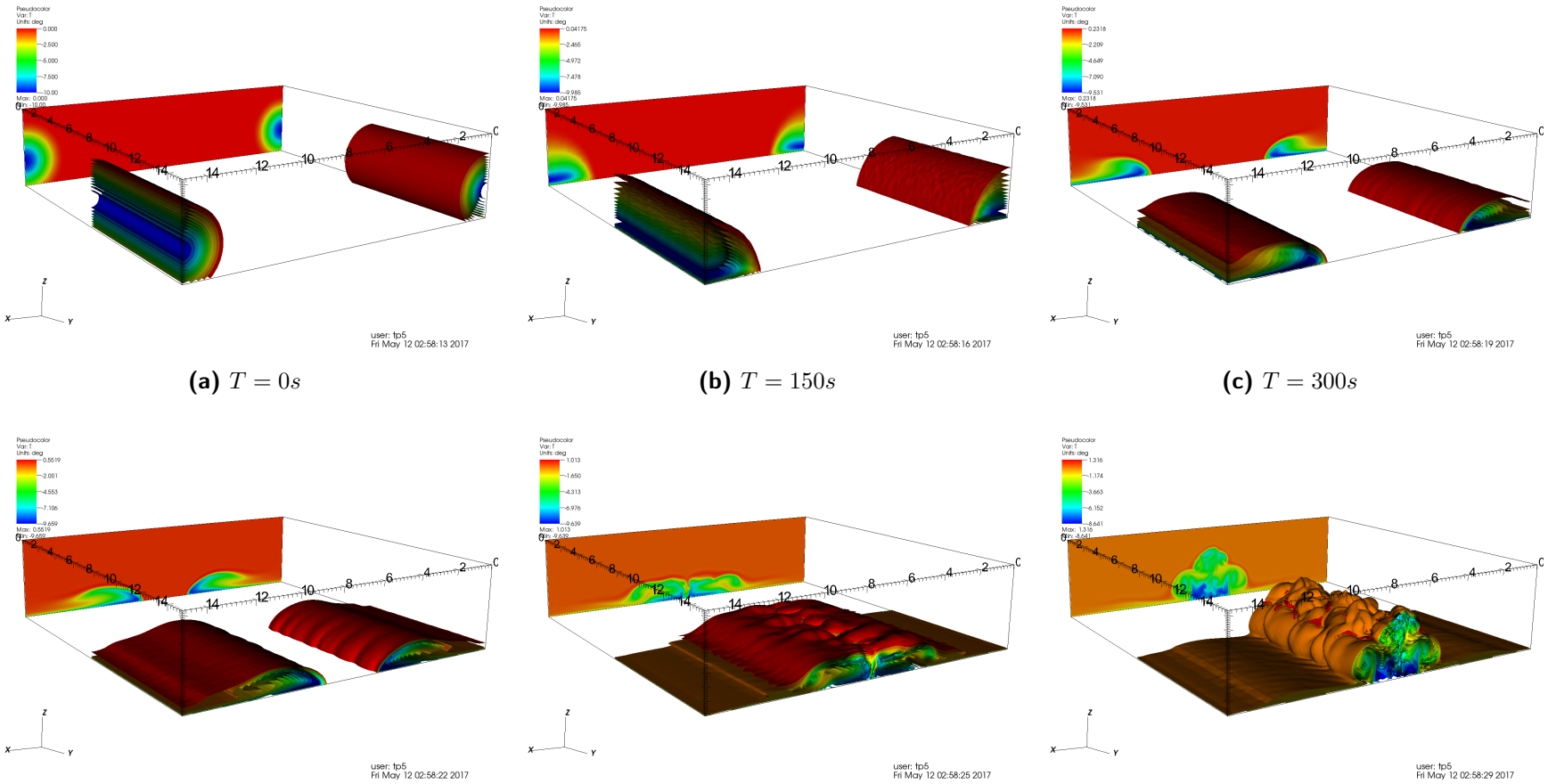


Figure 1.13: Max history of vertical vorticity

3-D Visualization with Visit in the next page



(a) $T = 0s$ **(b)** $T = 150s$ **(c)** $T = 300s$

(d) $T = 450s$ **(e)** $T = 600s$ **(f)** $T = 750s$

Figure 1.14: θ' field at different times showing the evolution of the profiles - the instability on the evolving front can also be seen at $T = 450s$ and $T = 600s$