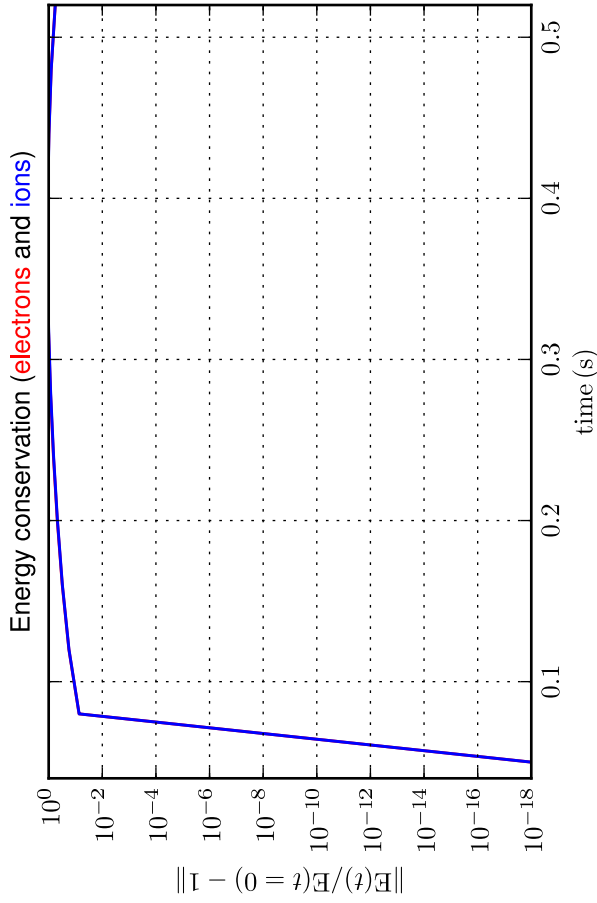
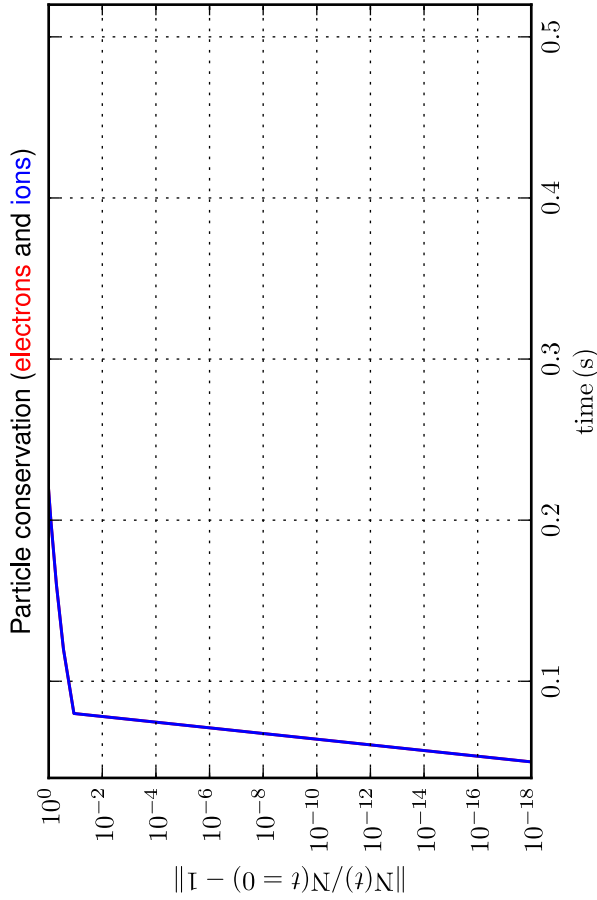
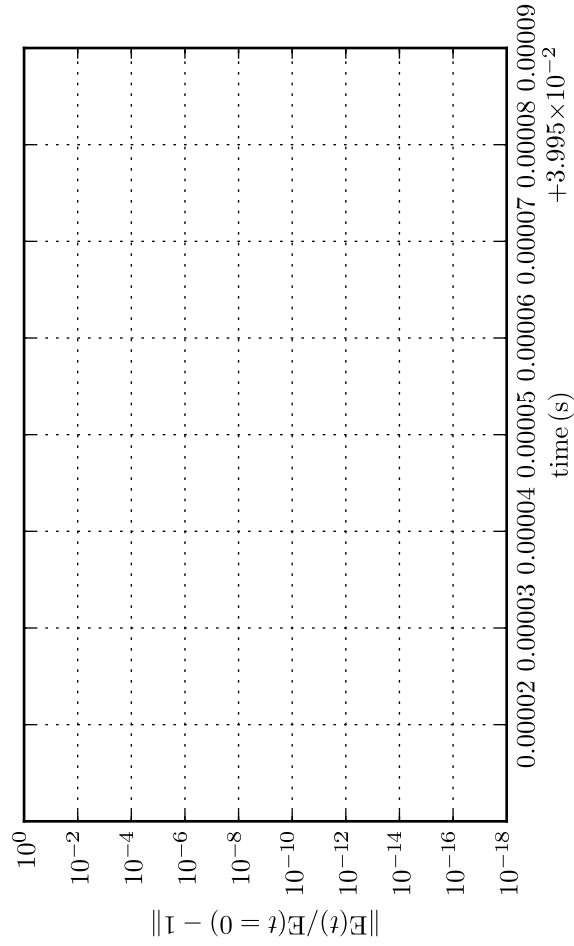
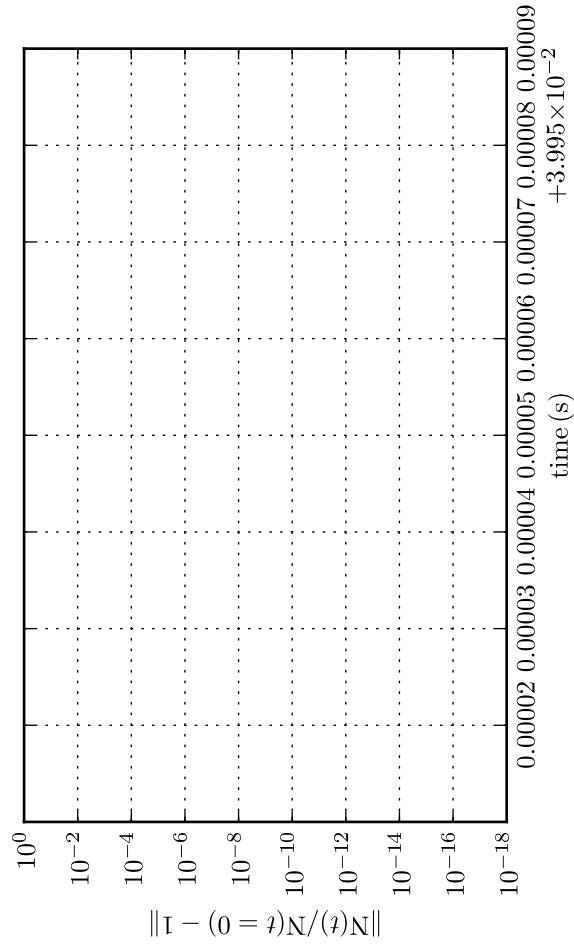


Part. & Energy conservation [Case: I.1.5.c, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 1.00 \text{ m/s}$ ,  $\Delta t = 4.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_p = 101$ ]

Comparison with initial solution - log scale; total time and zoom over time

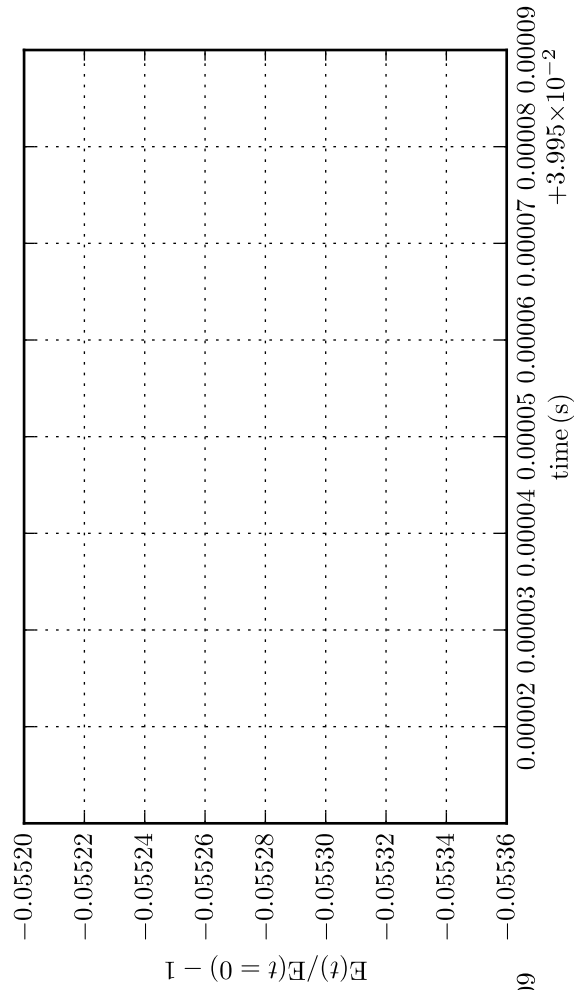
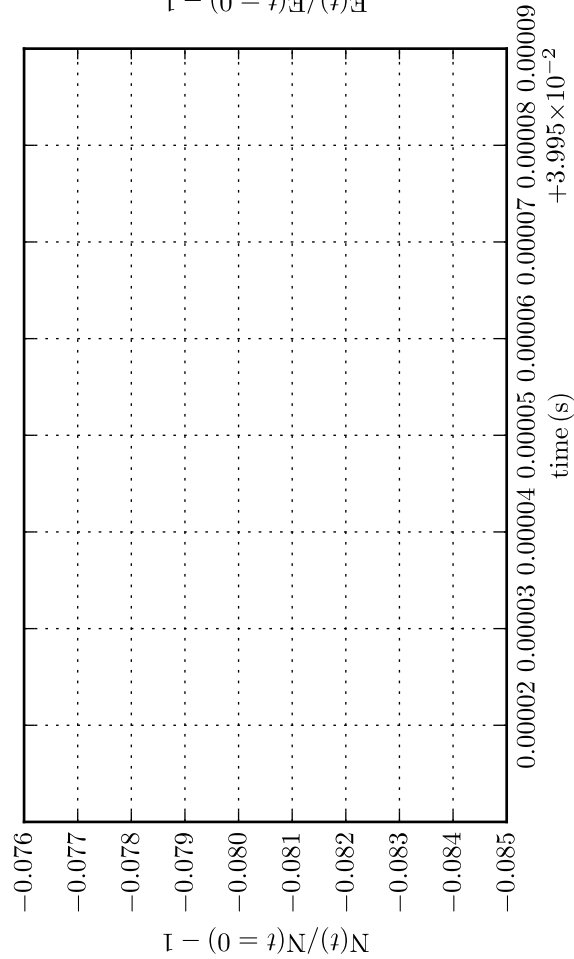
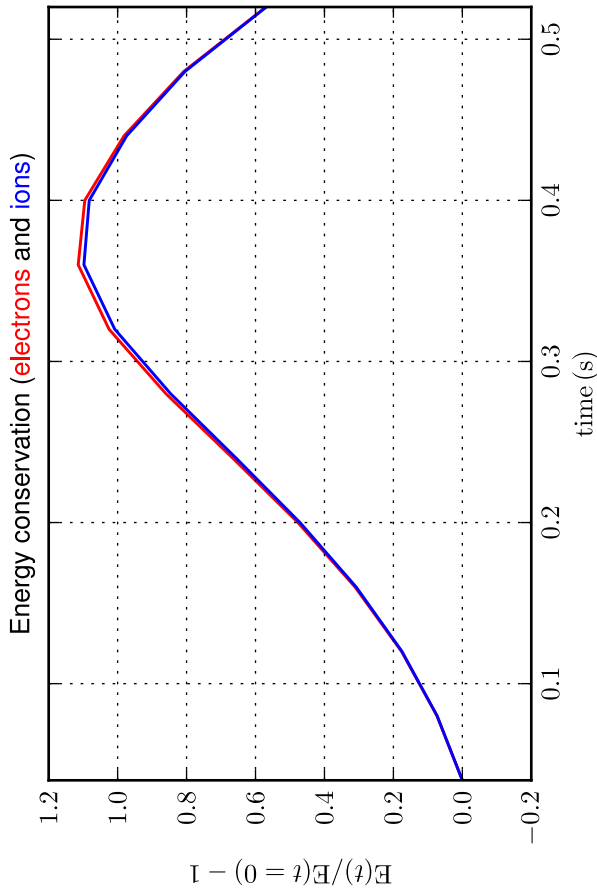
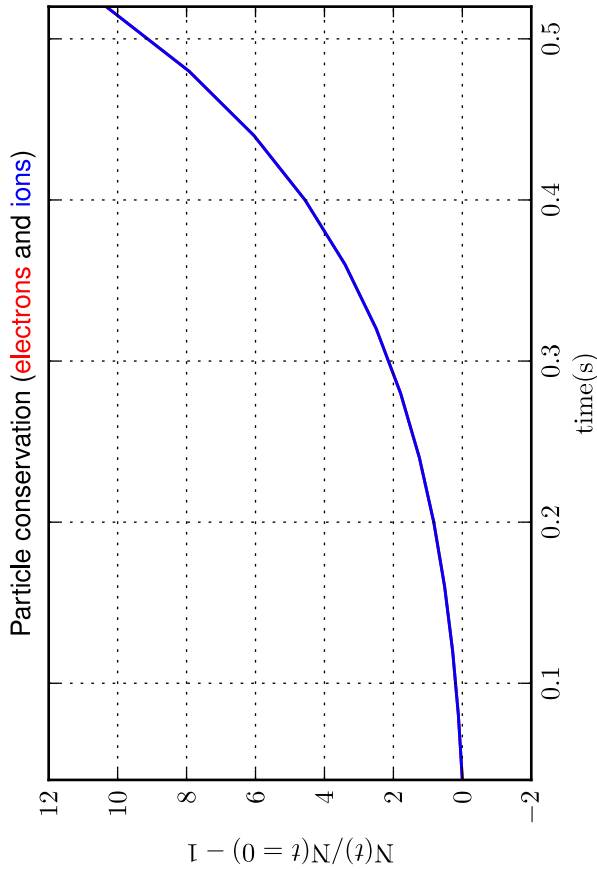


$$\|I - (0 = t)N/(t)N\|$$

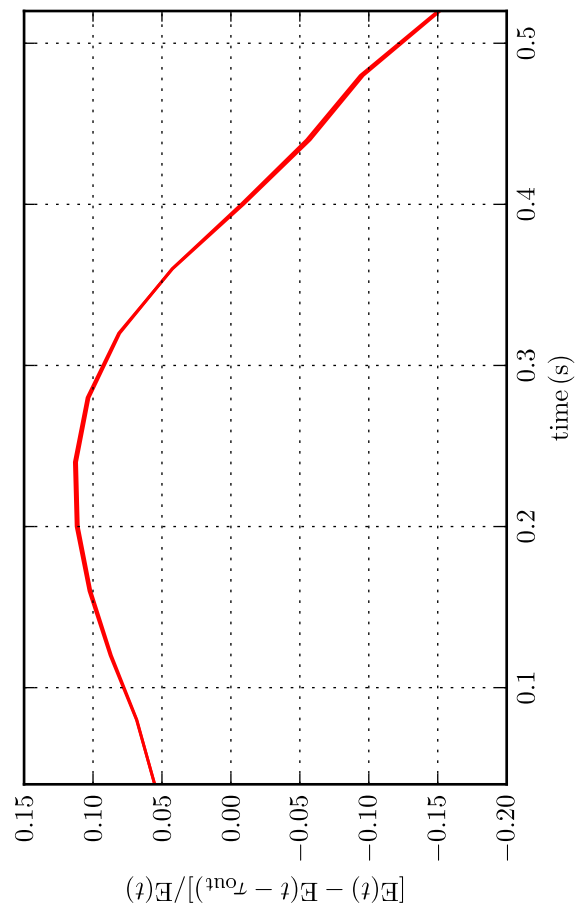
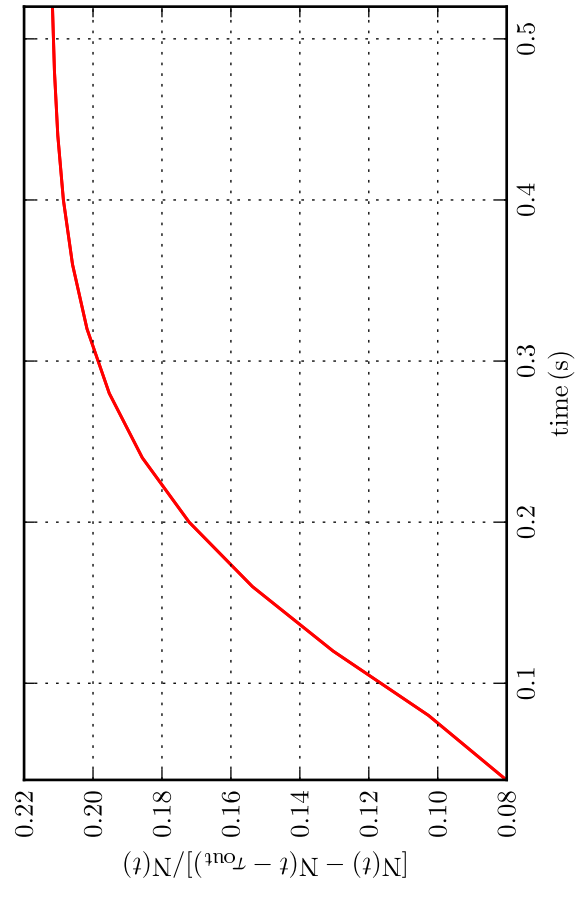
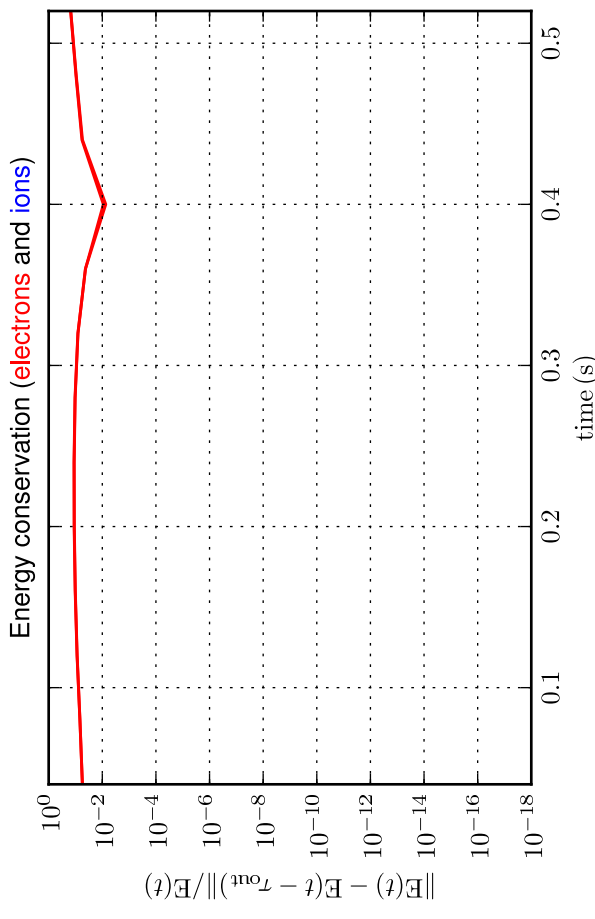
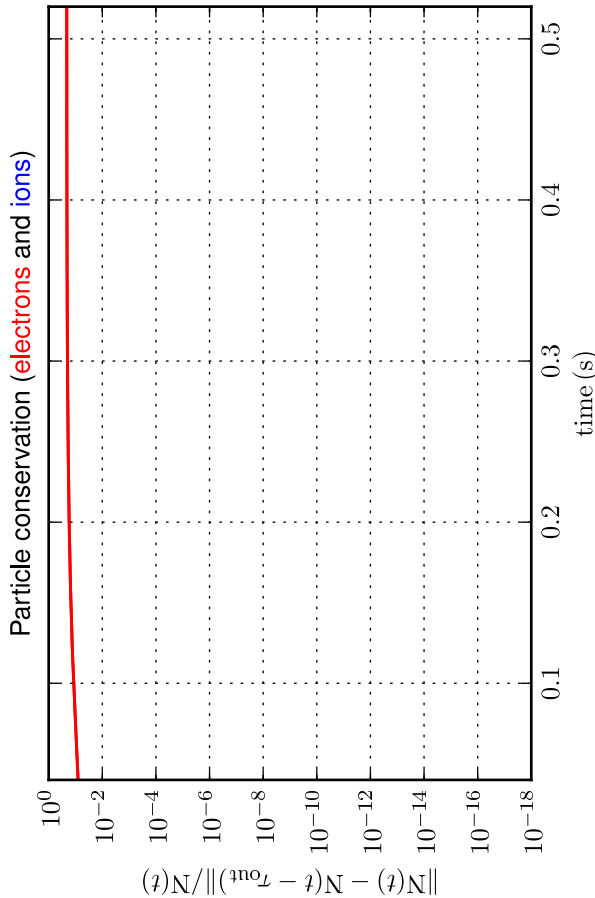


$$\|I - (0 = t)N/(t)N\|$$

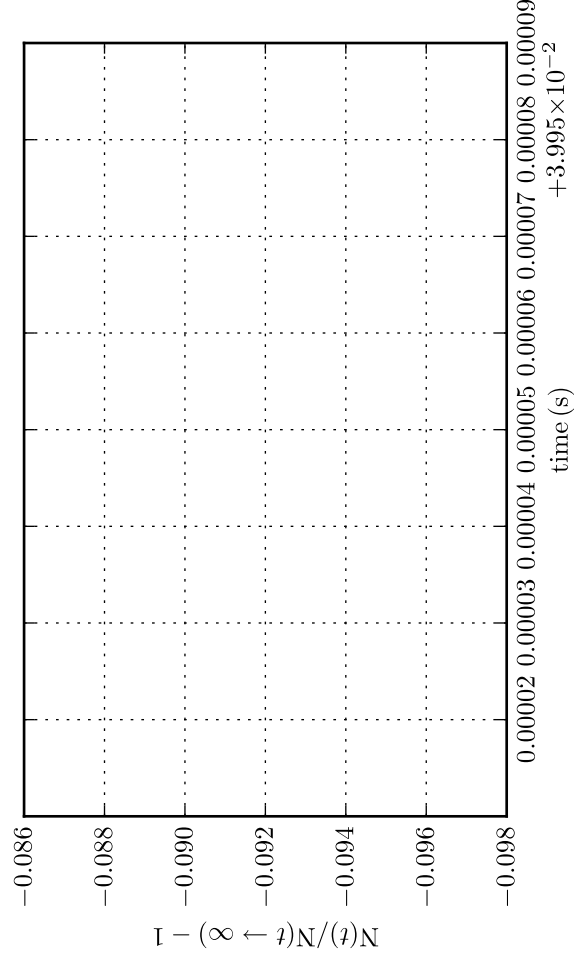
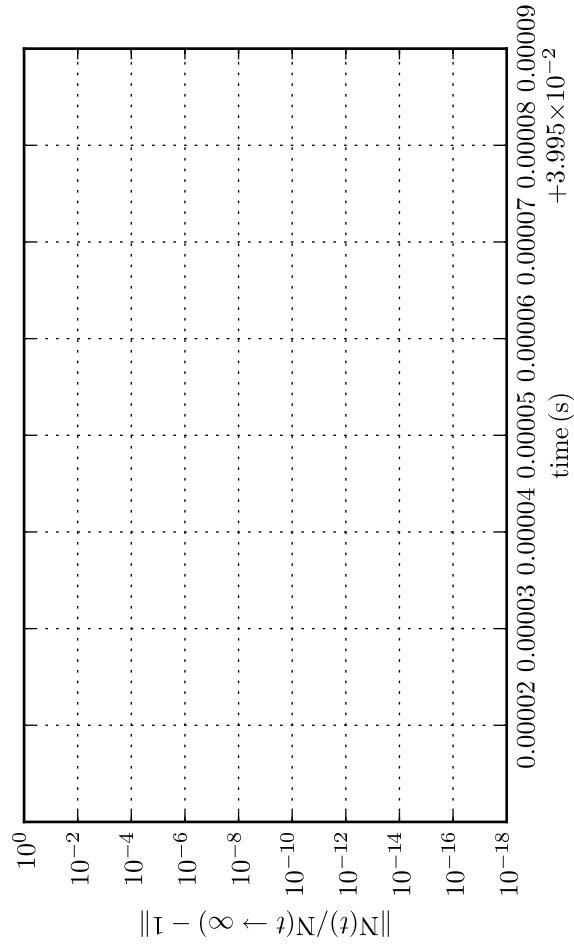
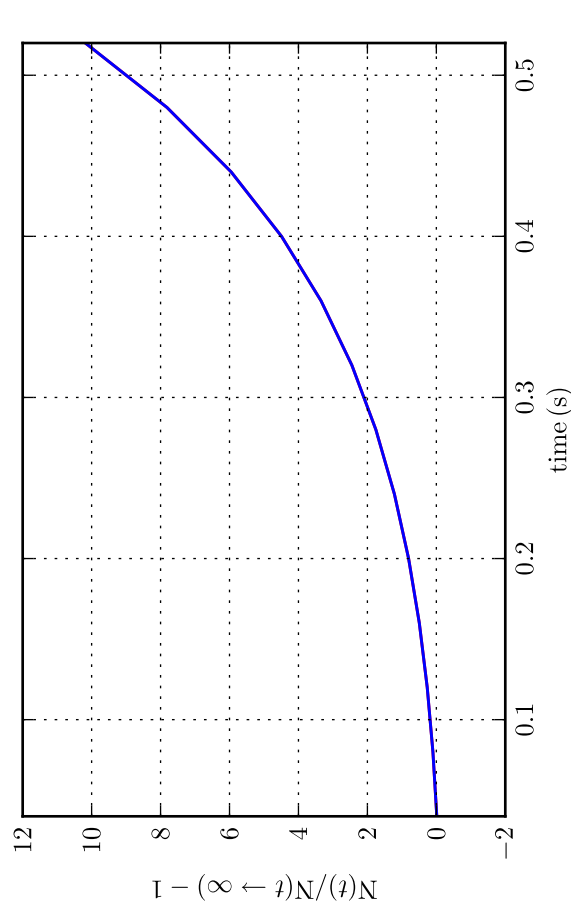
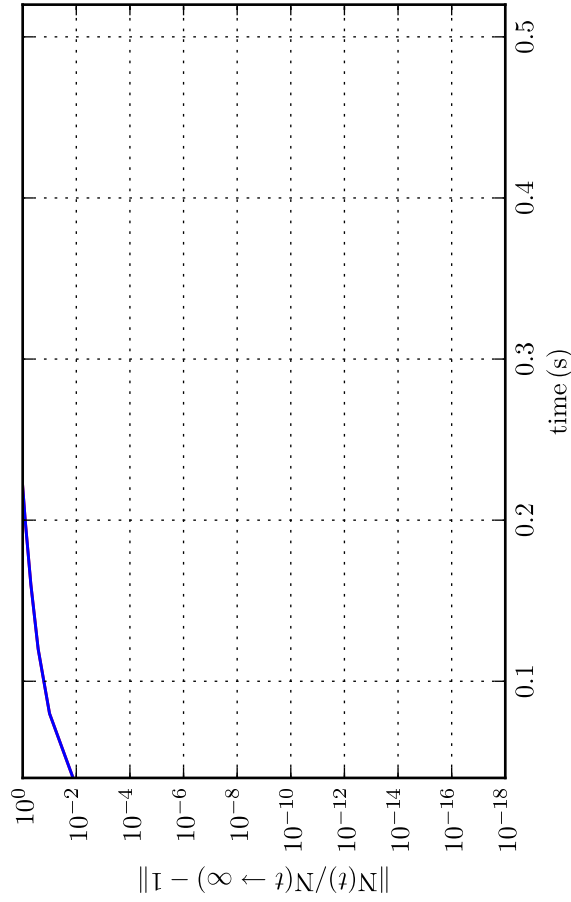
Part. & Energy conservation [Case: I.1.5.c, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 1.00 \text{ m/s}$ ,  $\Delta t = 4.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_p = 101$ ]  
 Comparison with initial solution - linear scale; total time and zoom over time



Part. & Energy conservation [Case: I.1.5.c, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 1.00 \text{ m/s}$ ,  $\Delta t = 4.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_p = 101$ ]  
 Comparison with previous time-sampled ( $\tau_{\text{out}}$ ) solution - log and linear scales

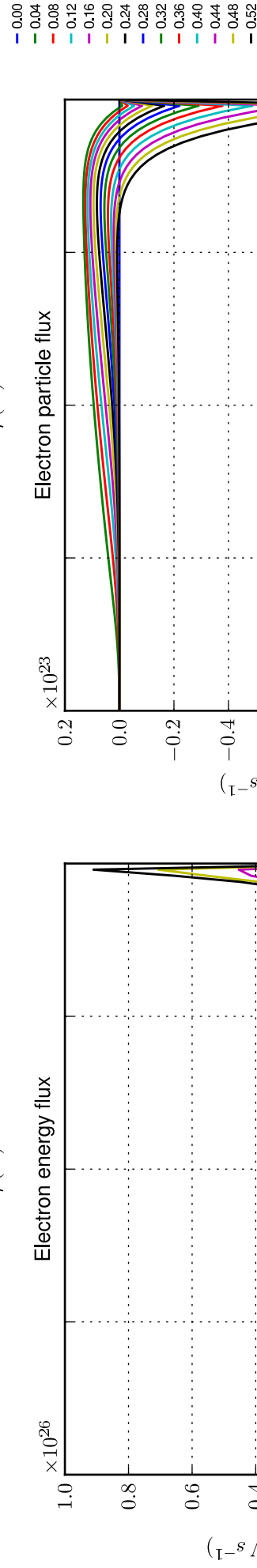
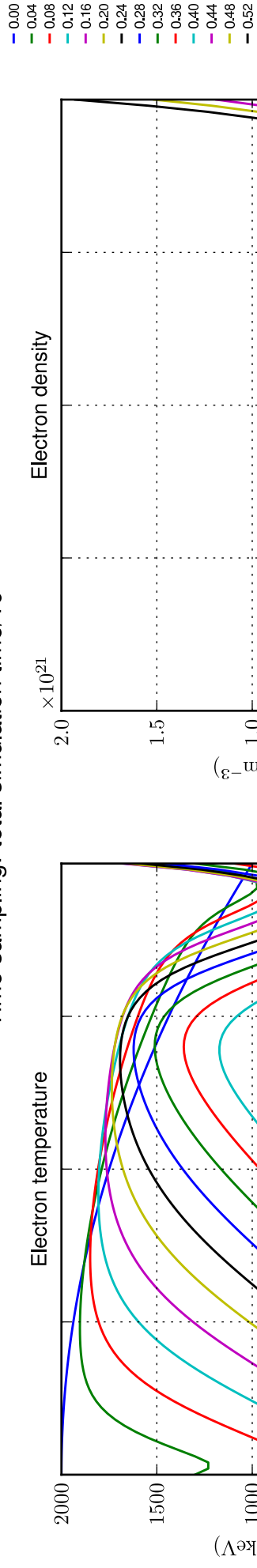


Particle conservation [Case: I.1.5.c, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 1.00 \text{ m/s}$ ,  $\Delta t = 4.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_p = 101$ ]  
 Comparison with asymptotic solution (electrons and ions); total time and zoom over time



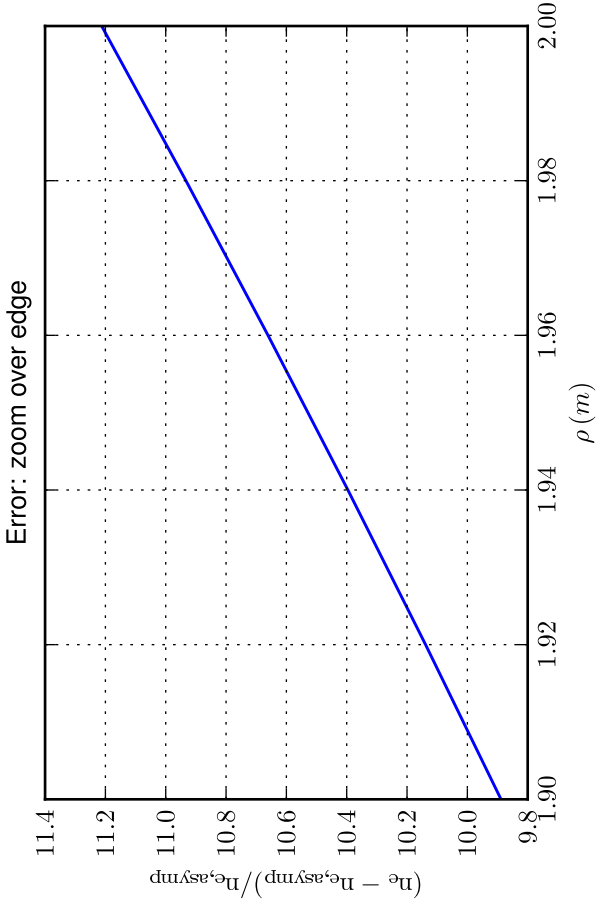
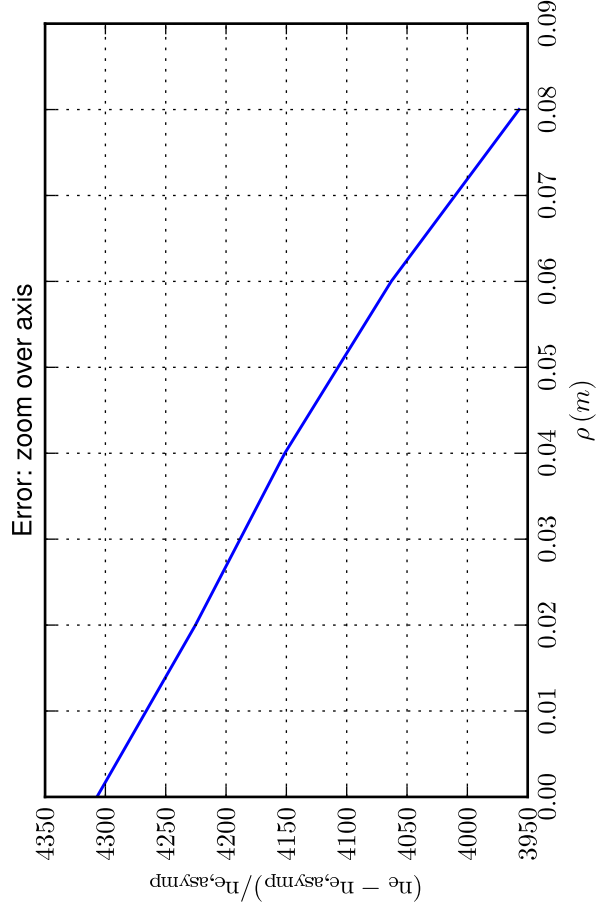
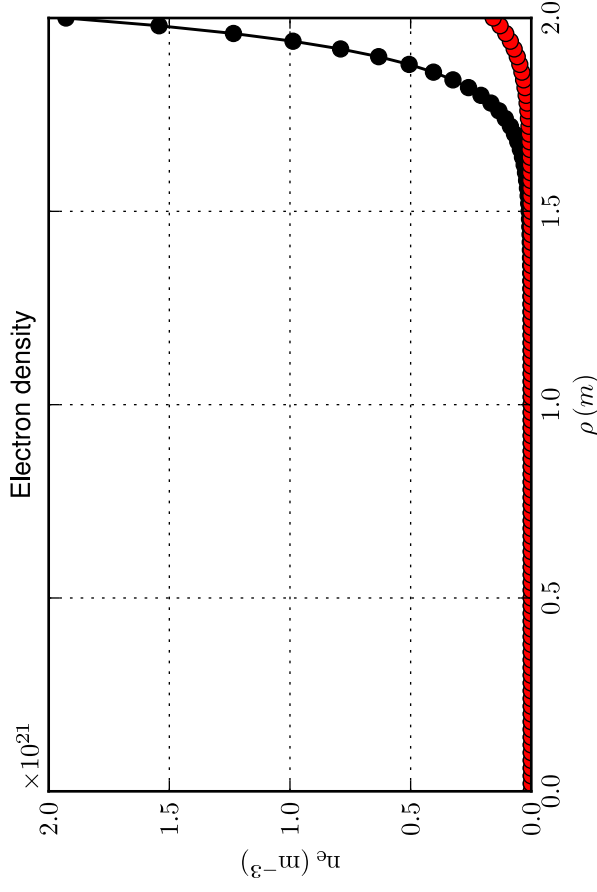
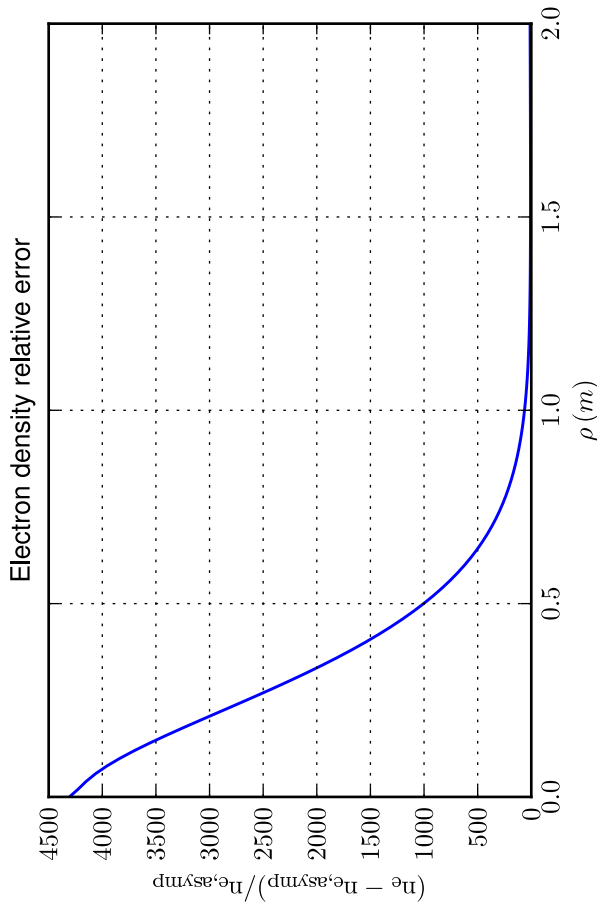
Profiles [Case: I.1.5.c, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 1.00 \text{ m/s}$ ,  $\Delta t = 4.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]

Time sampling: total simulation time/10



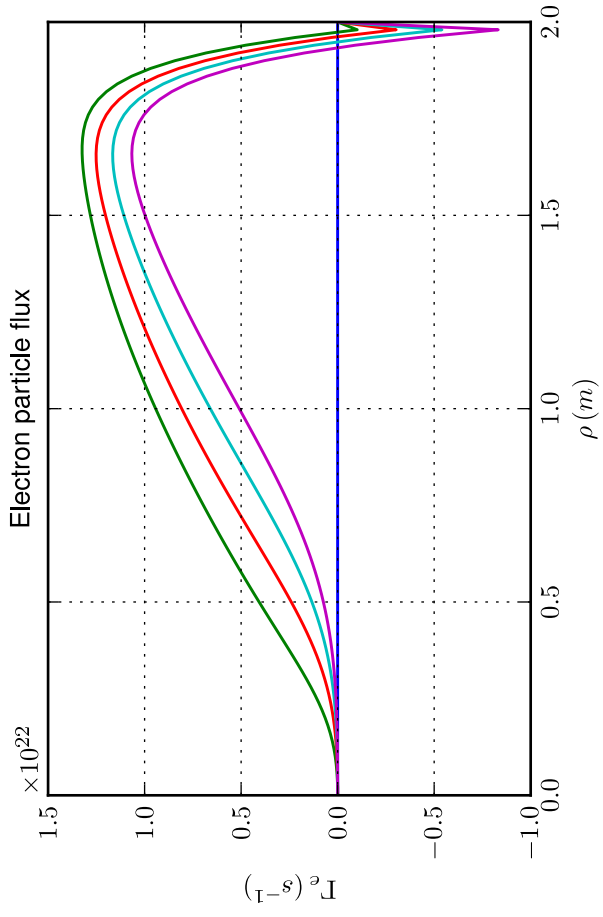
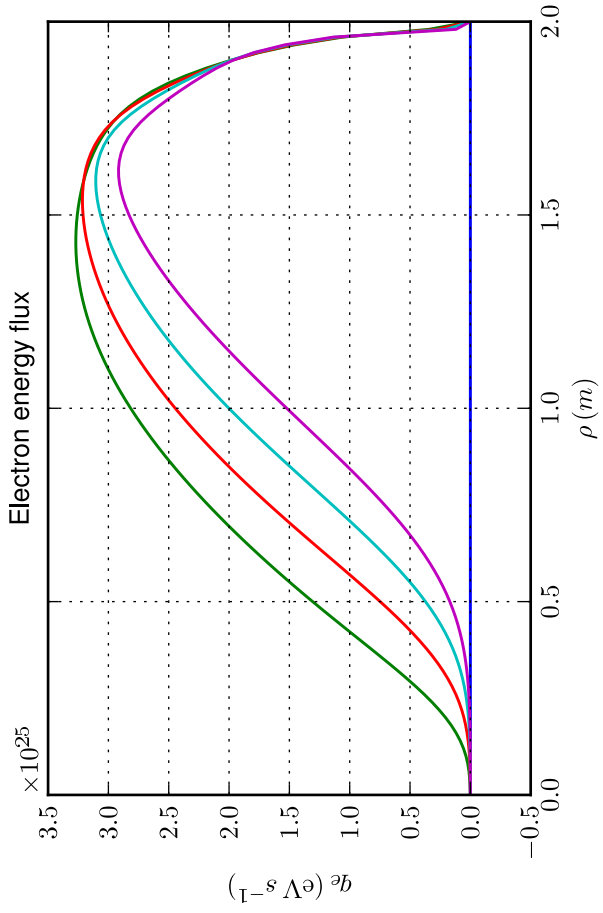
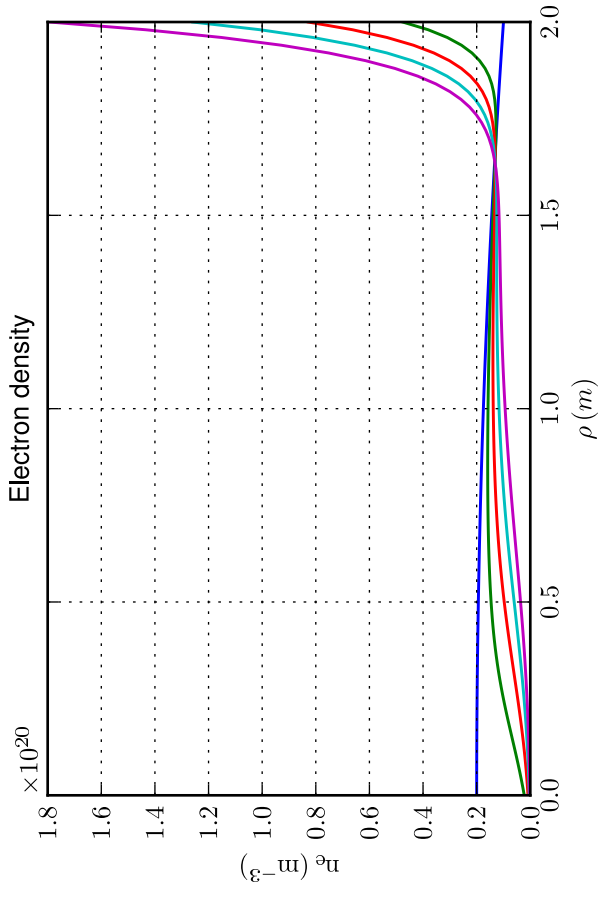
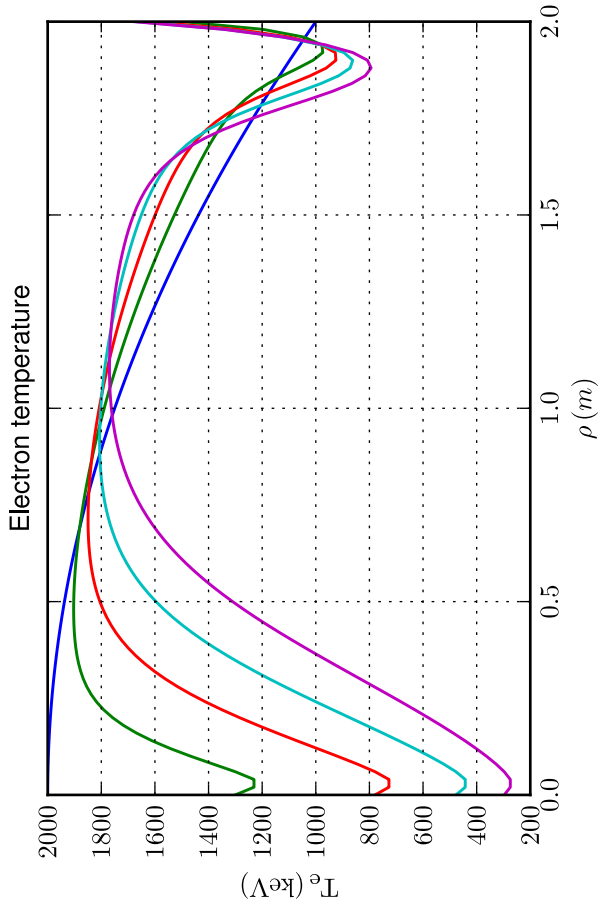
Profiles [Case: I.1.5.c, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 1.00 \text{ m/s}$ ,  $\Delta t = 4.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]

Comparison with asymptotic solution



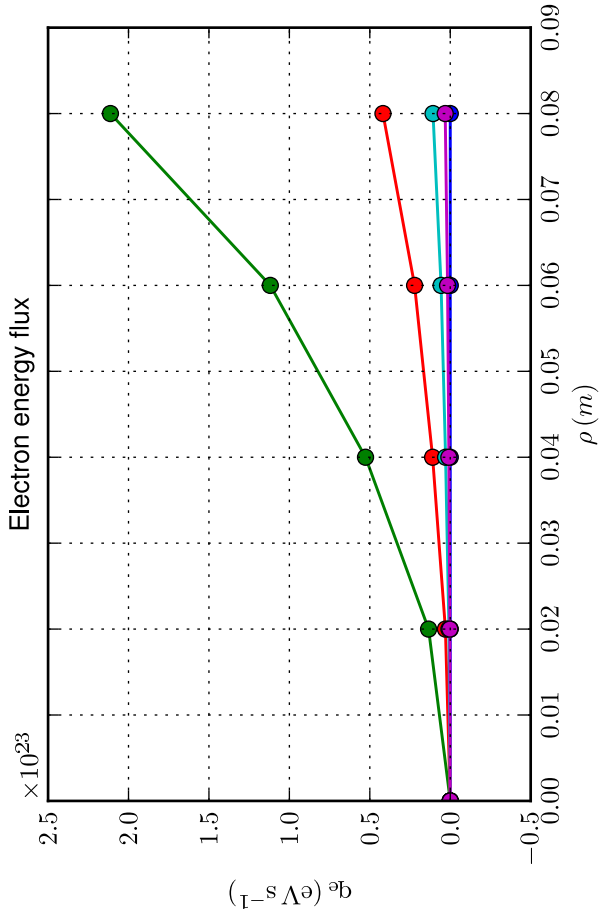
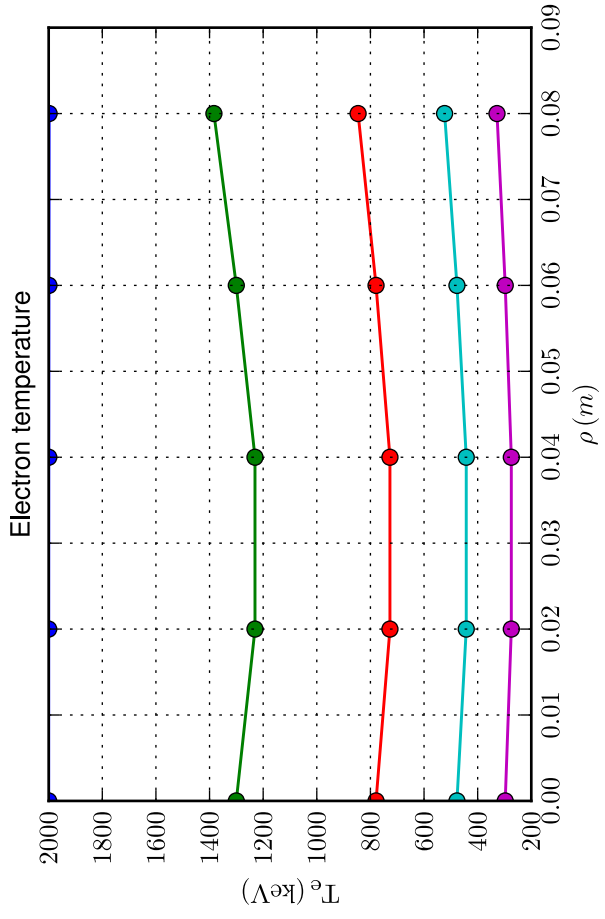
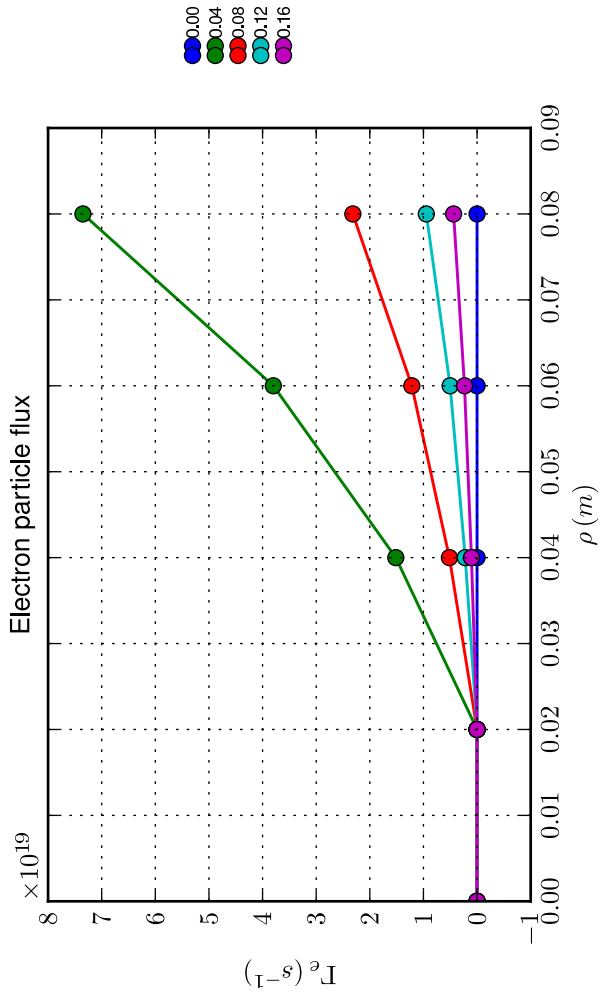
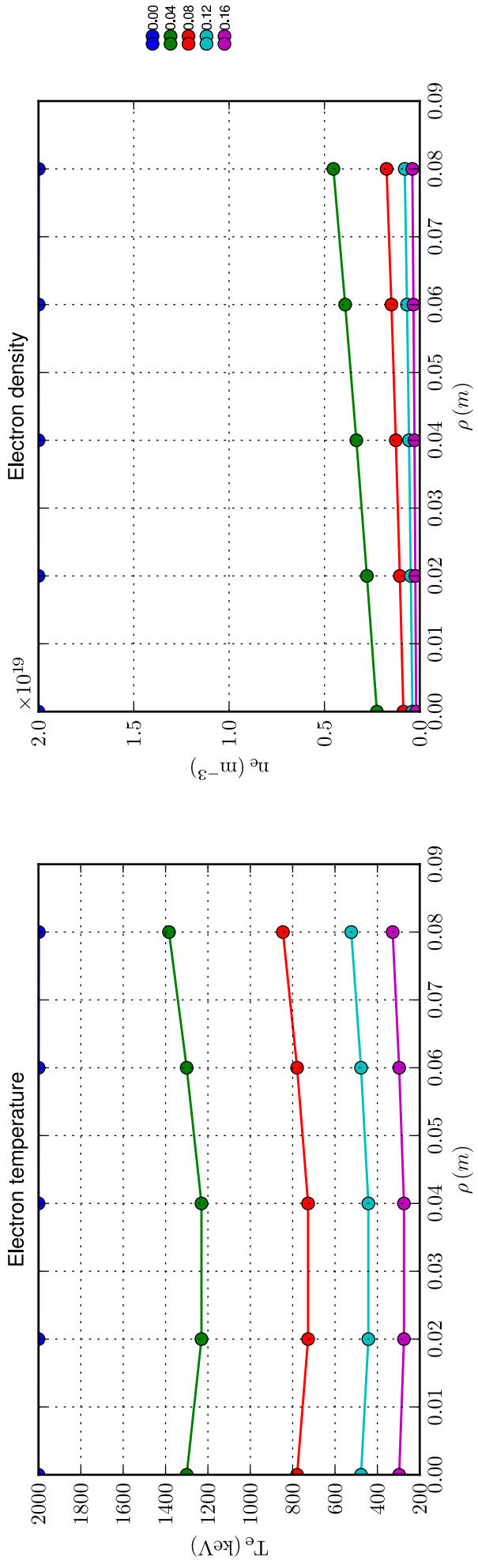
Profiles [Case: 1.1.5.c, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 1.00 \text{ m/s}$ ,  $\Delta t = 4.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]

Time sampling: first 10 time slices or zoom over time  $0.1 \times (a^2/D)/|1 - (Va/D)| = 0.21 \text{ s}$



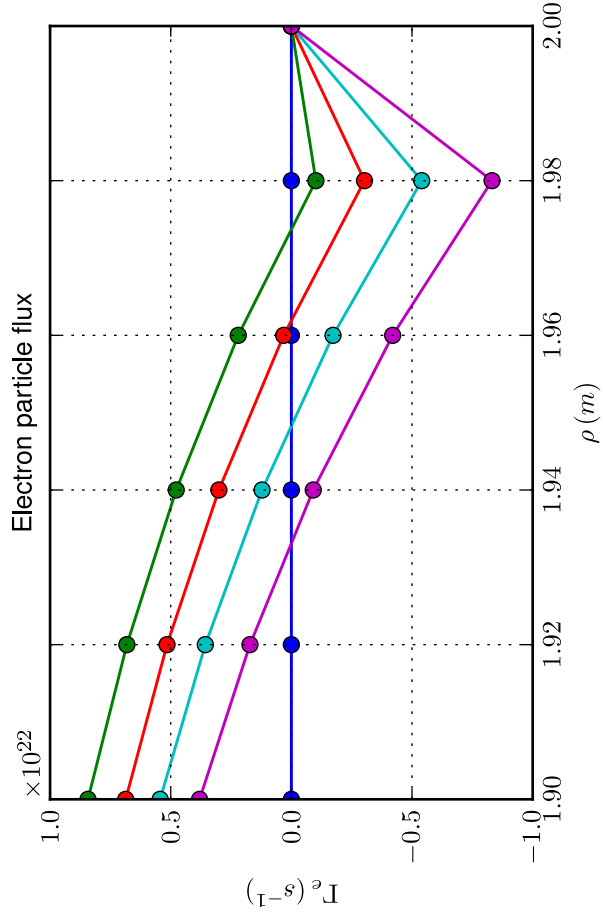
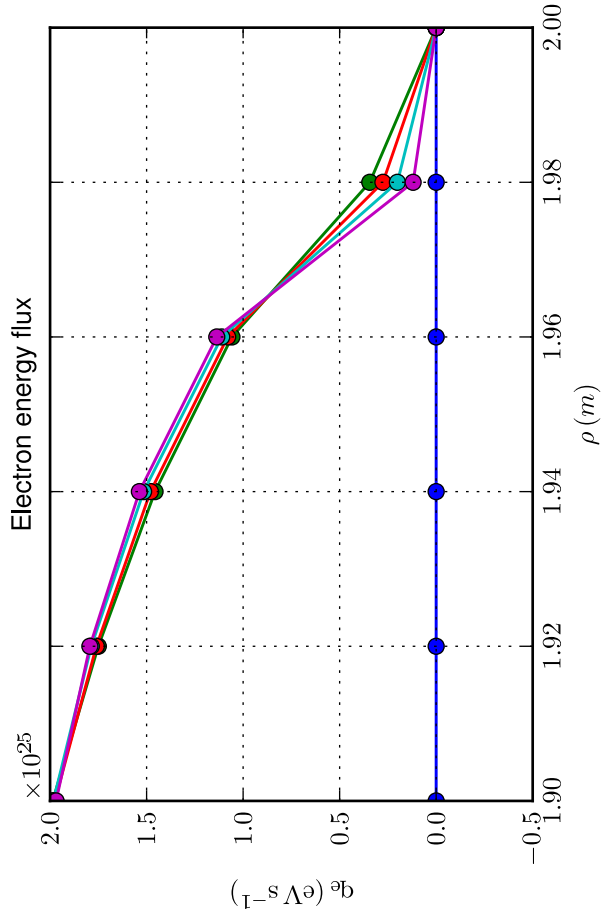
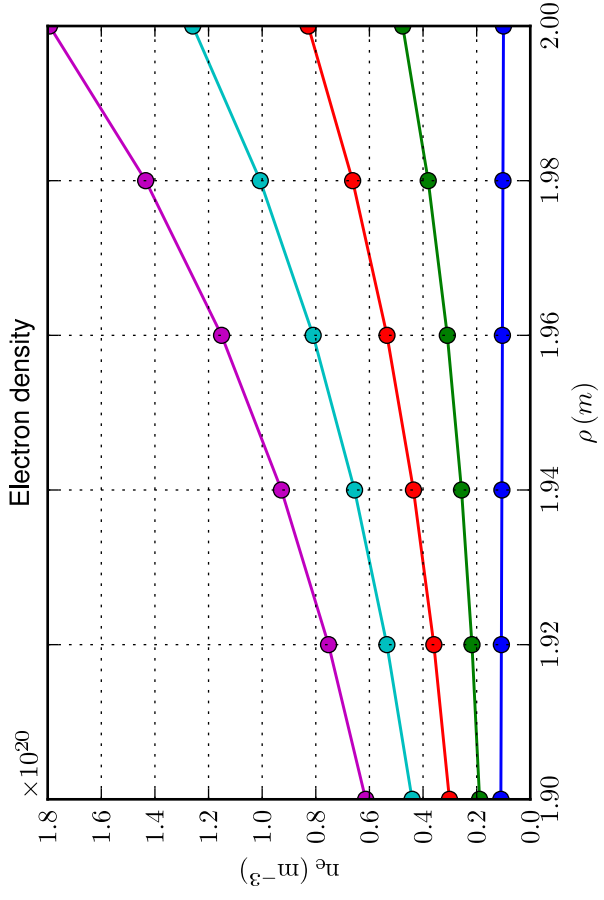
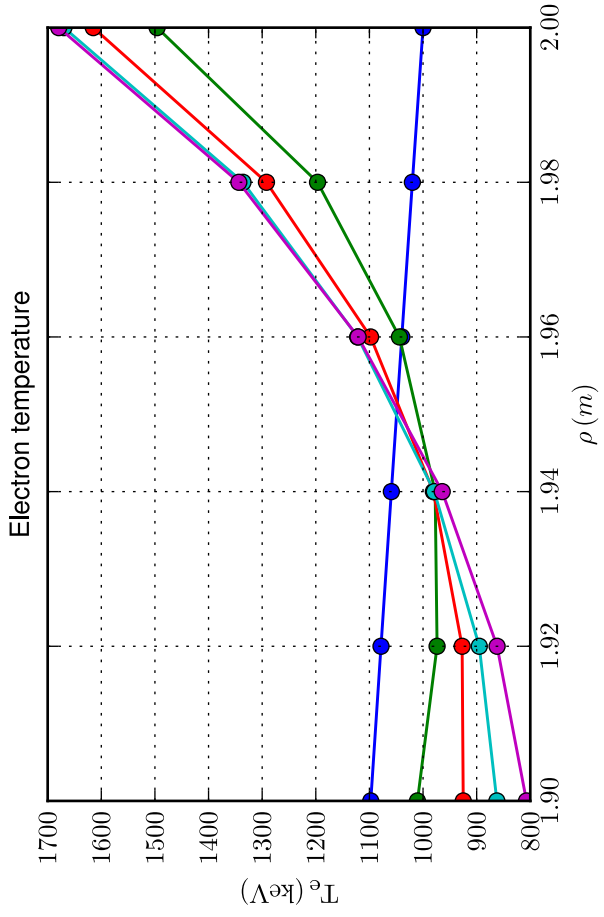
0.00  
0.04  
0.08  
0.12  
0.16

Profiles [Case: I.1.5.c, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 1.00 \text{ m/s}$ ,  $\Delta t = 4.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]  
 Spatial zoom over magnetic axis; time sampling: first 10 time slices or zoom over time  $0.1 \times (a^2/D)/|1 - (Va/D)| = 0.21 \text{ s}$



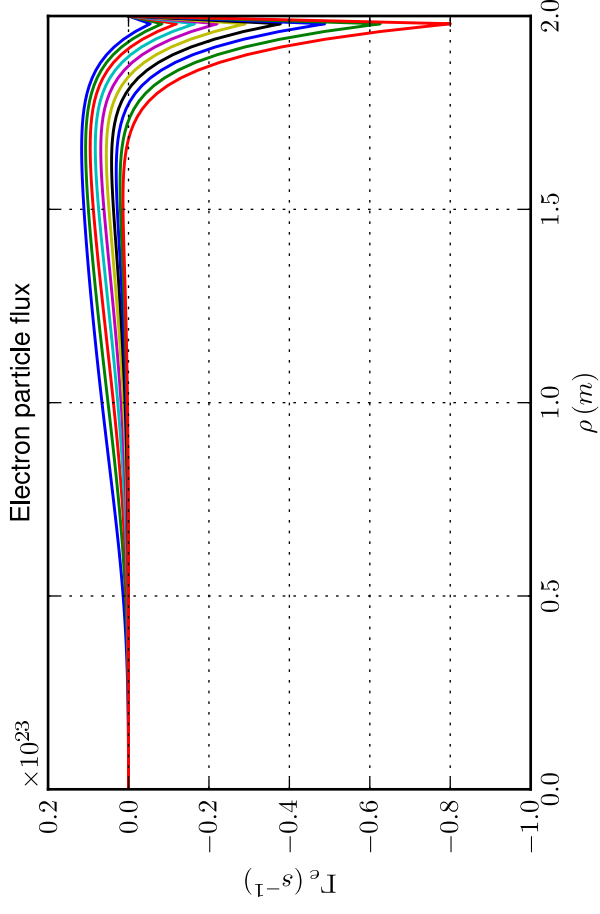
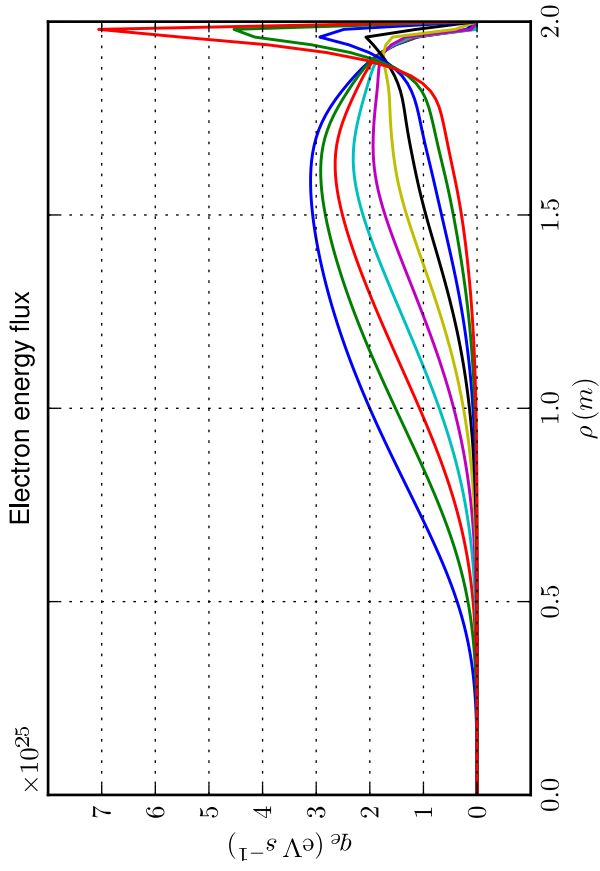
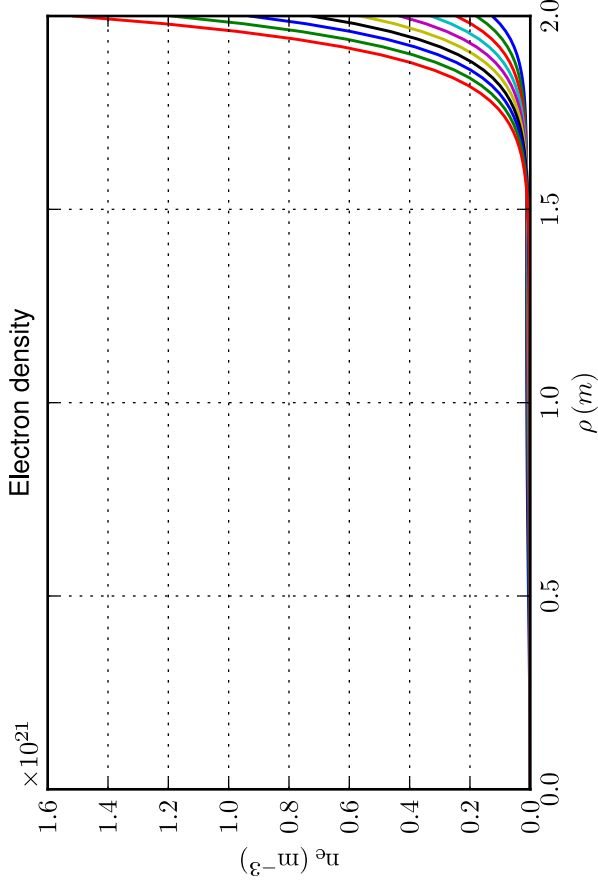
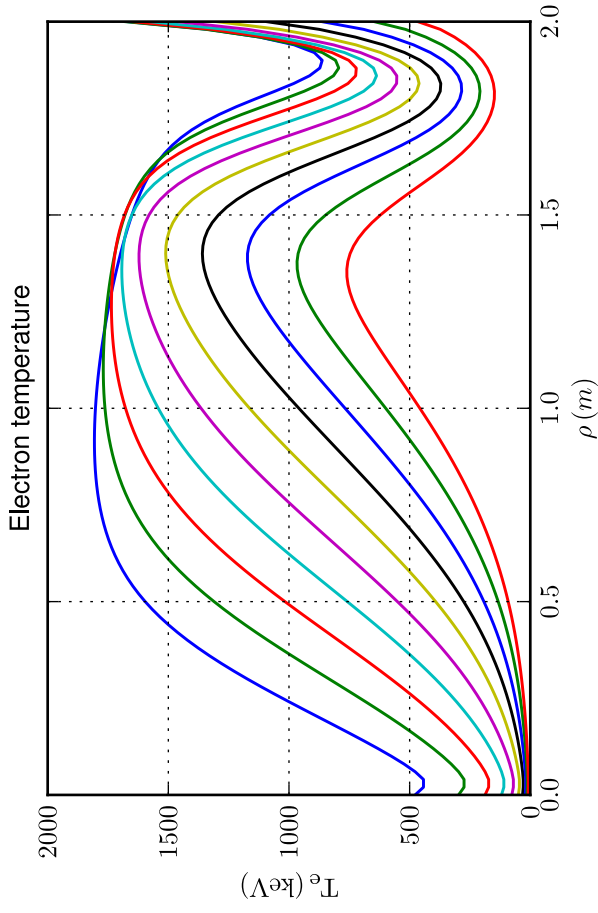


Profiles [Case: I.1.5.c, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 1.00 \text{ m/s}$ ,  $\Delta t = 4.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]  
 Spatial zoom over edge; time sampling: first 10 time slices or zoom over time  $0.1 \times (a^2/D)/|1 - (V_a/D)| = 0.21 \text{ s}$



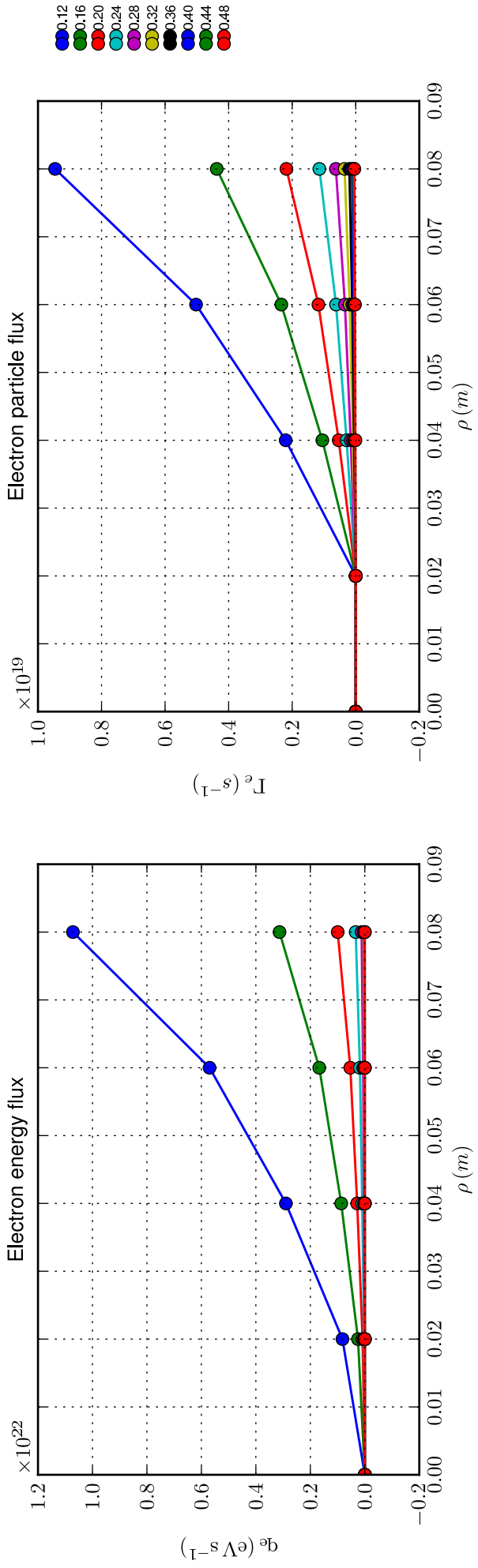
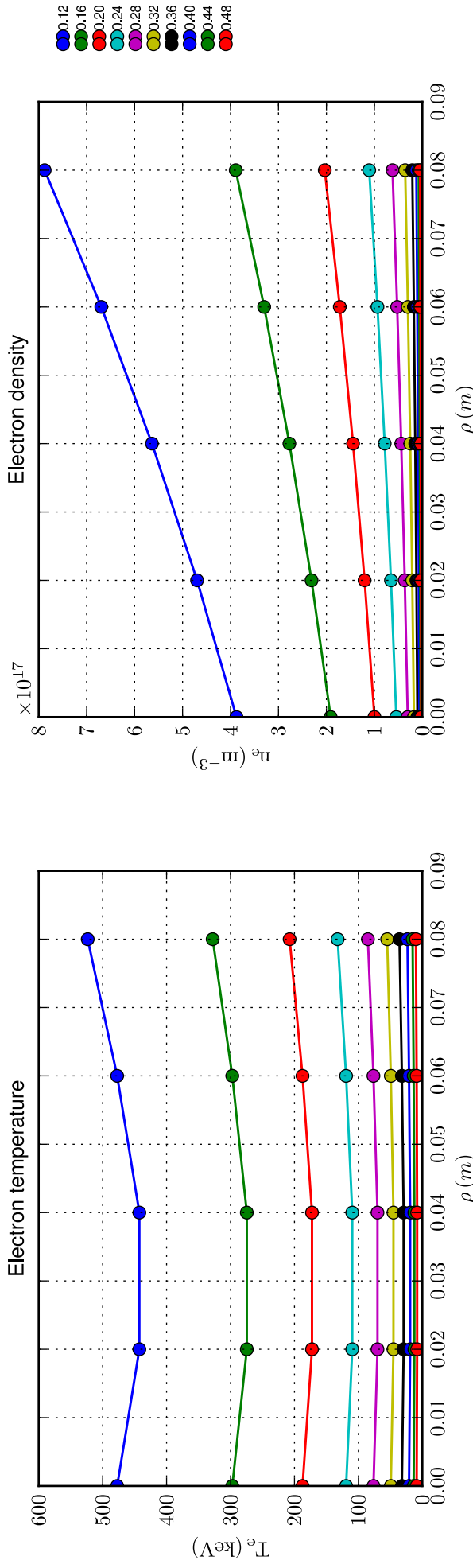
Profiles [Case: I.1.5.c, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 1.00 \text{ m/s}$ ,  $\Delta t = 4.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]

Time sampling: last 10 time slices



0.12  
0.16  
0.20  
0.24  
0.28  
0.32  
0.36  
0.40  
0.44  
0.48

Profiles [Case: I.1.5.c, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 1.00 \text{ m/s}$ ,  $\Delta t = 4.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]  
 Spatial zoom over magnetic axis; time sampling: last 10 time slices



Profiles [Case: I.1.5.c, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 1.00 \text{ m/s}$ ,  $\Delta t = 4.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]  
 Spatial zoom over edge; time sampling: last 10 time slices

