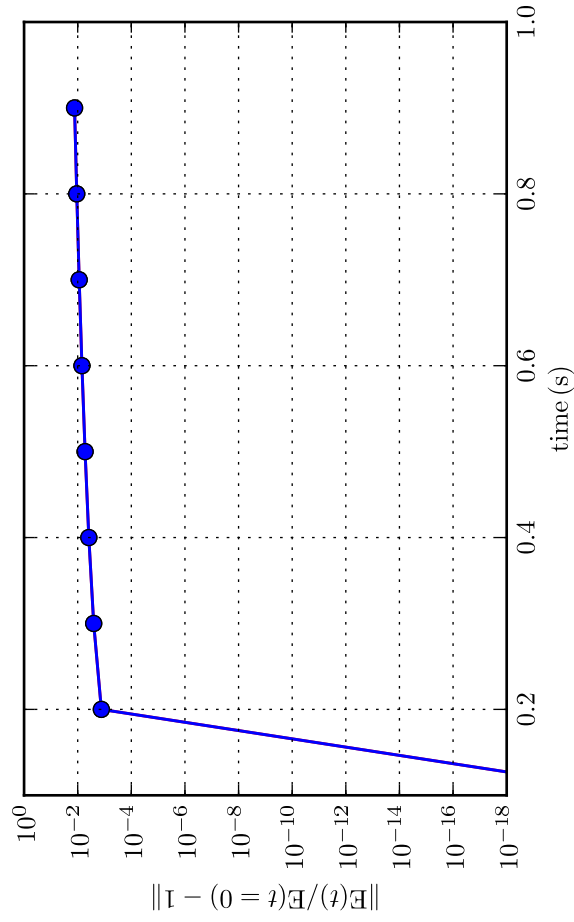
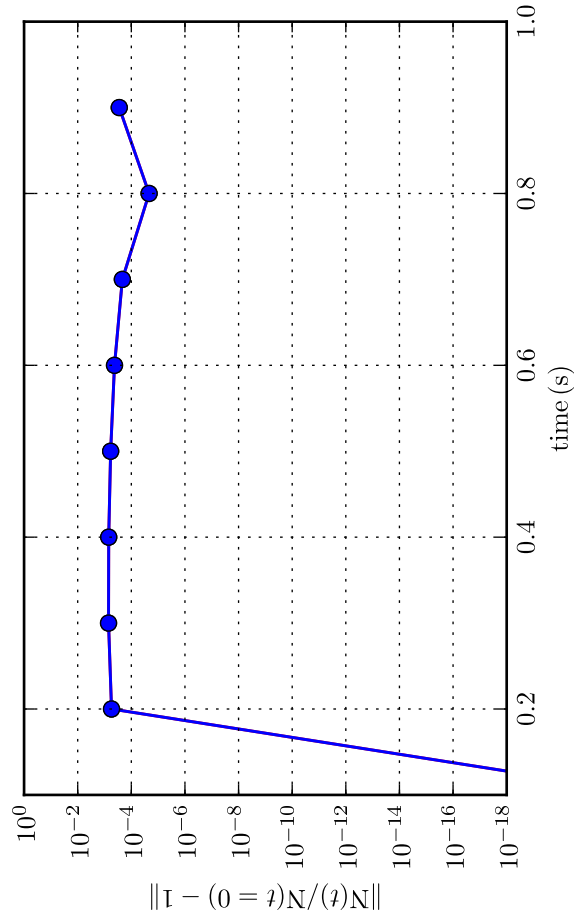
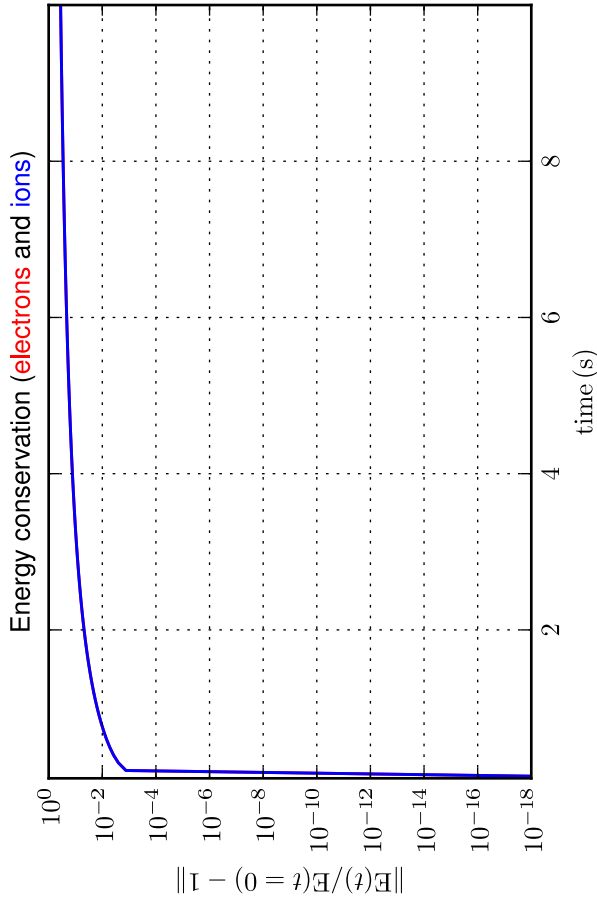
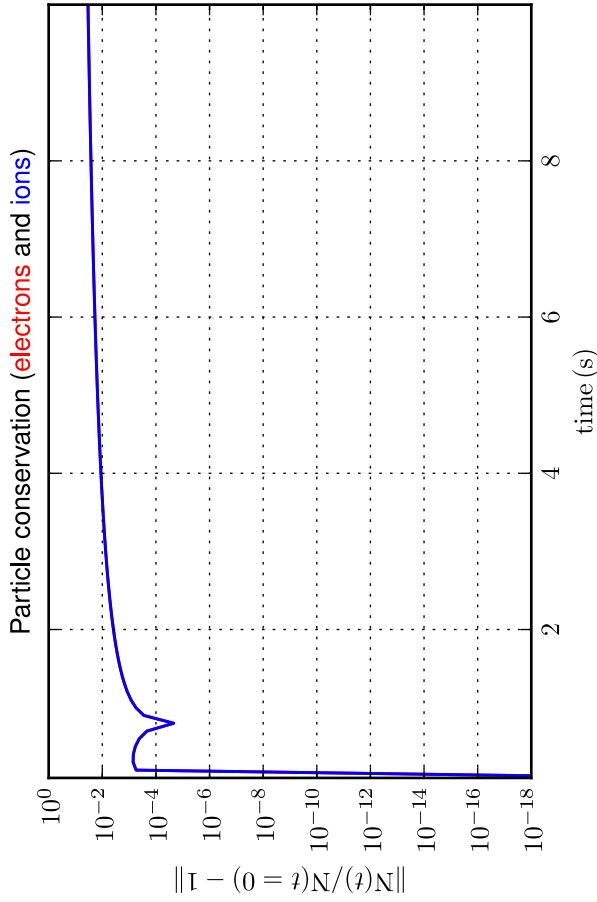


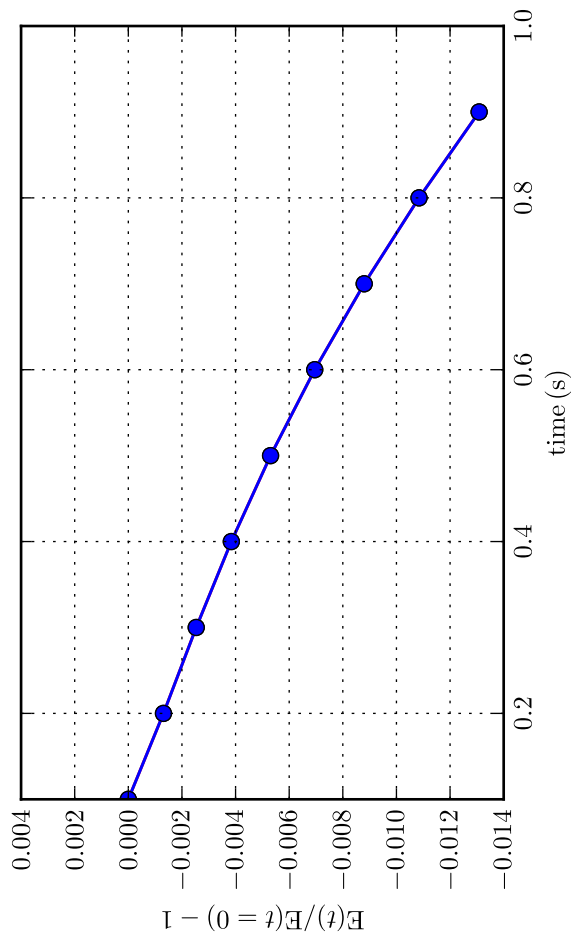
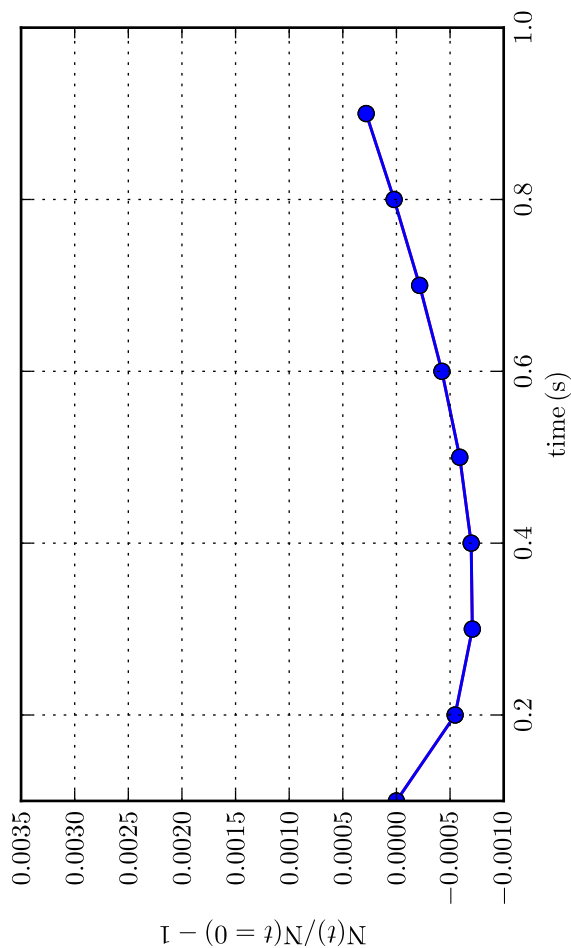
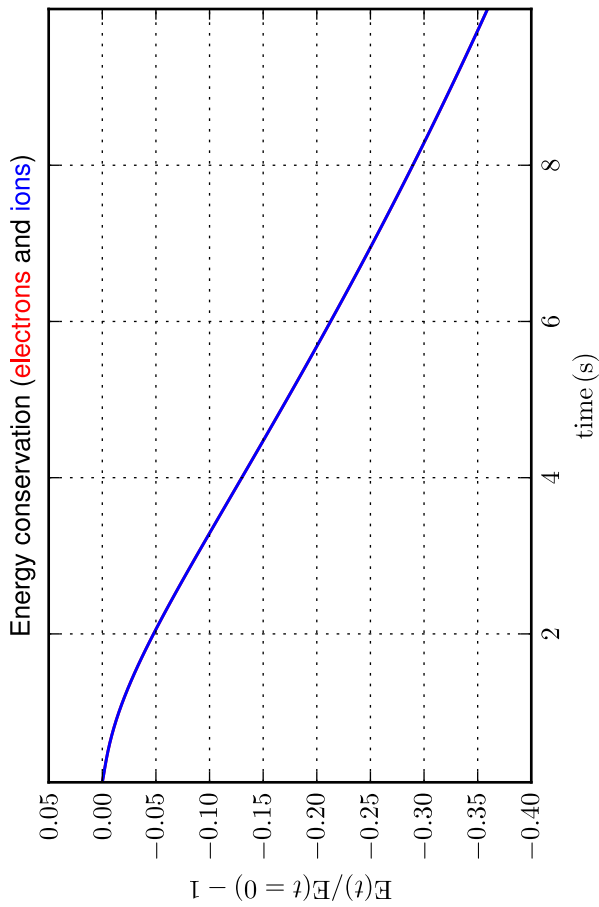
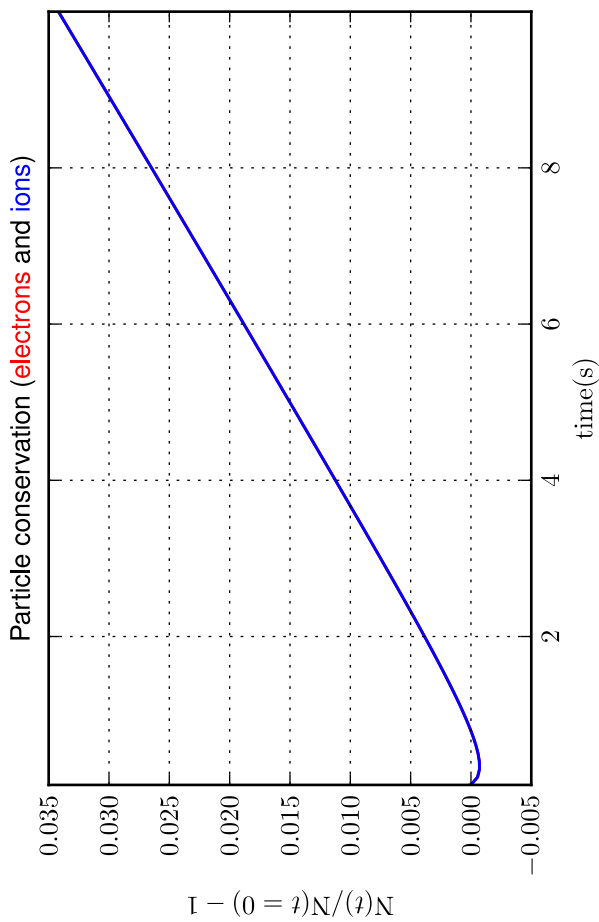
**Part. & Energy conservation [Case: I.1.5.i, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = -0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_p = 101$ ]**

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

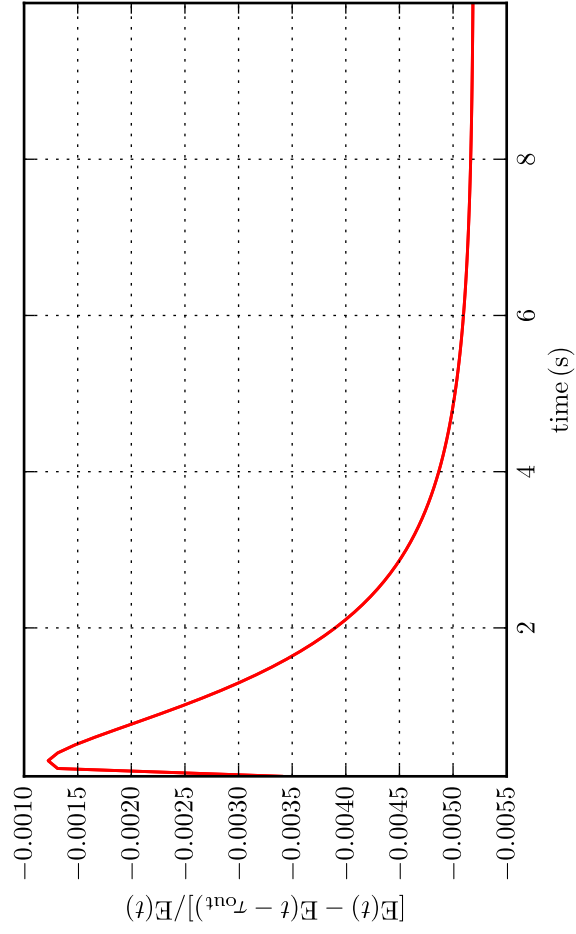
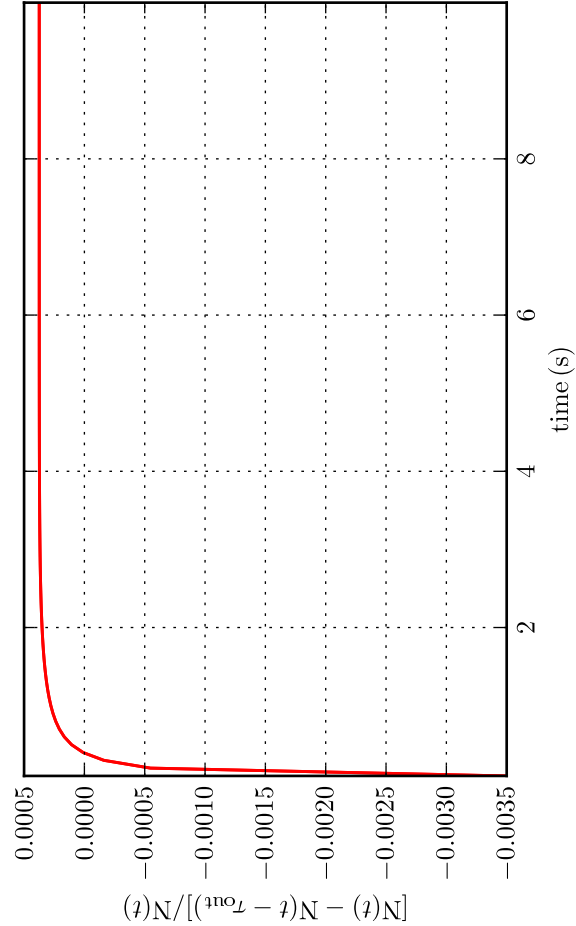
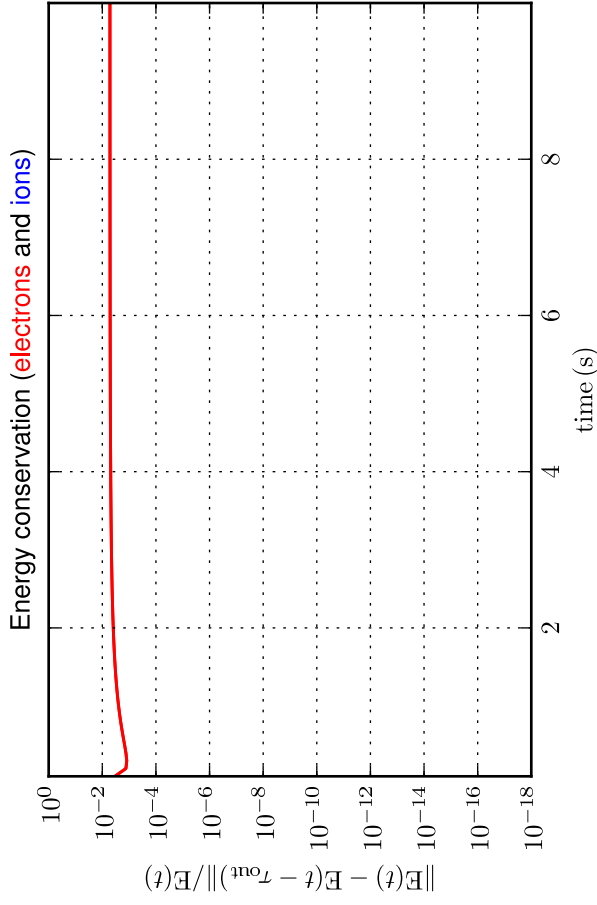
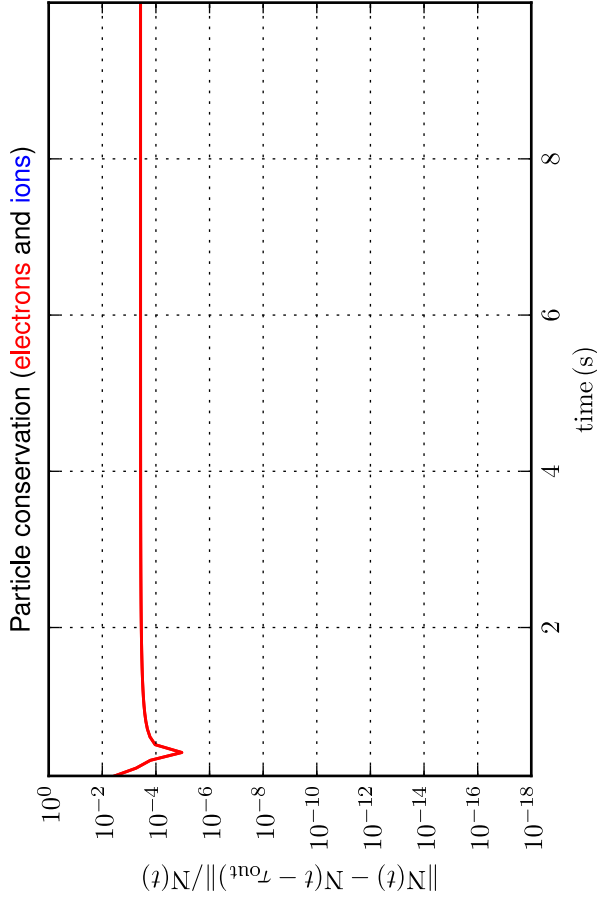


**Part. & Energy conservation [Case: I.1.5.i, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = -0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_p = 101$ ]**

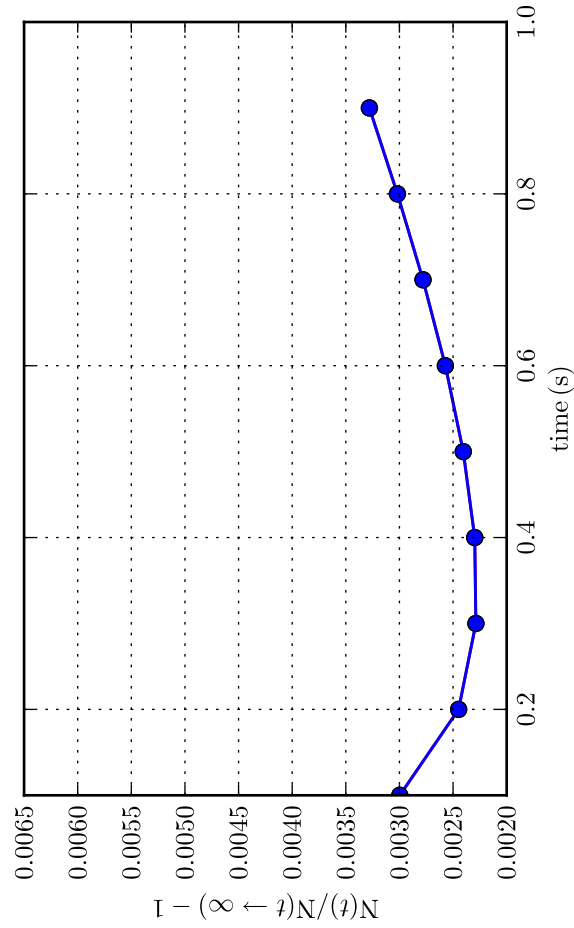
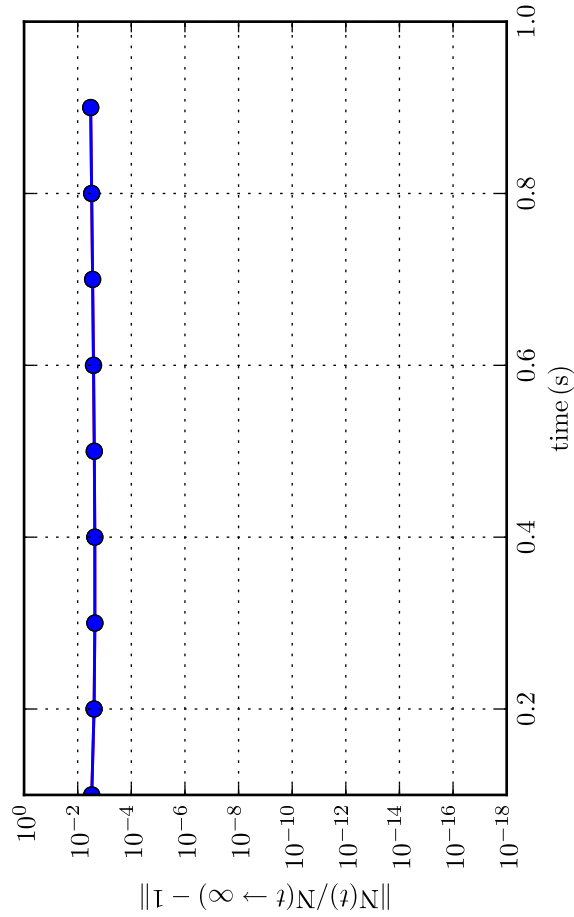
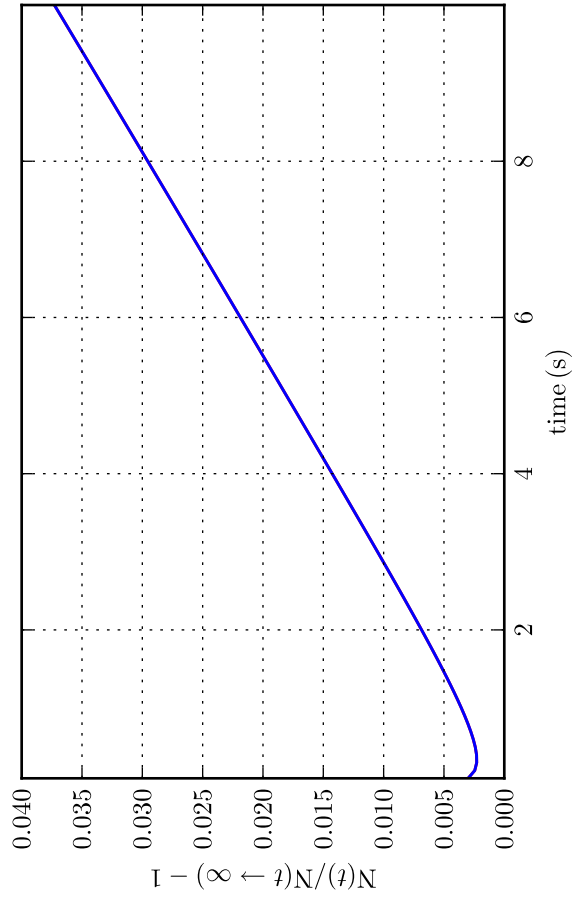
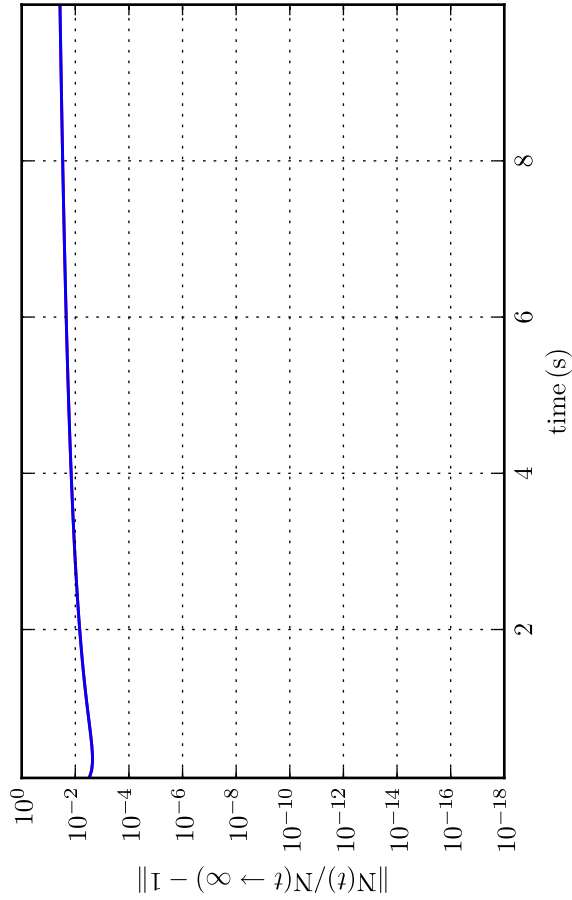
Comparison with initial solution - linear scale; total time and zoom over time



Part. & Energy conservation [Case: I.1.5.i, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = -0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_p = 101$ ]  
 Comparison with previous time-sampled ( $\tau_{\text{out}}$ ) solution - log and linear scales

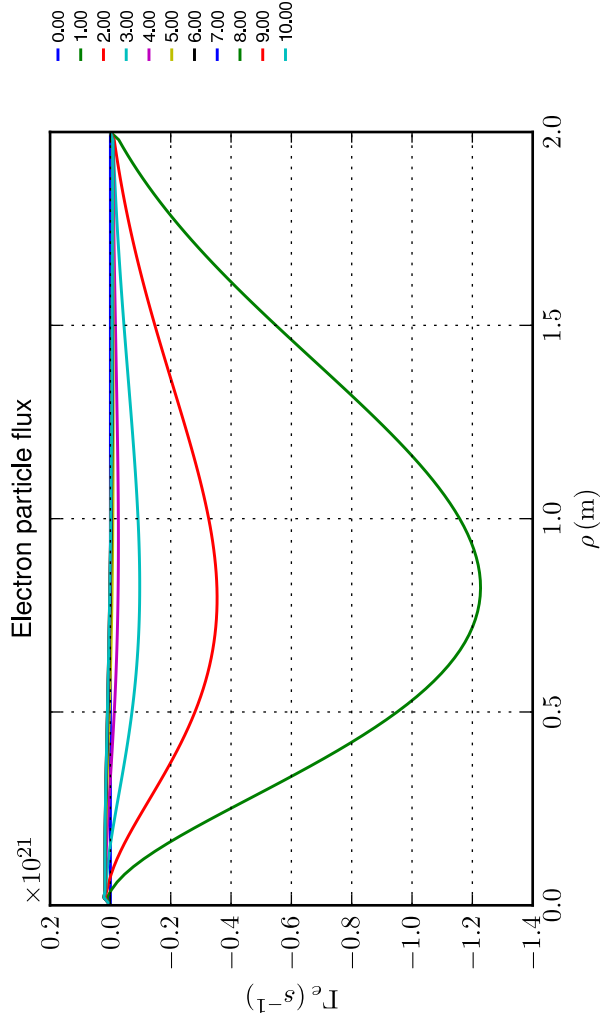
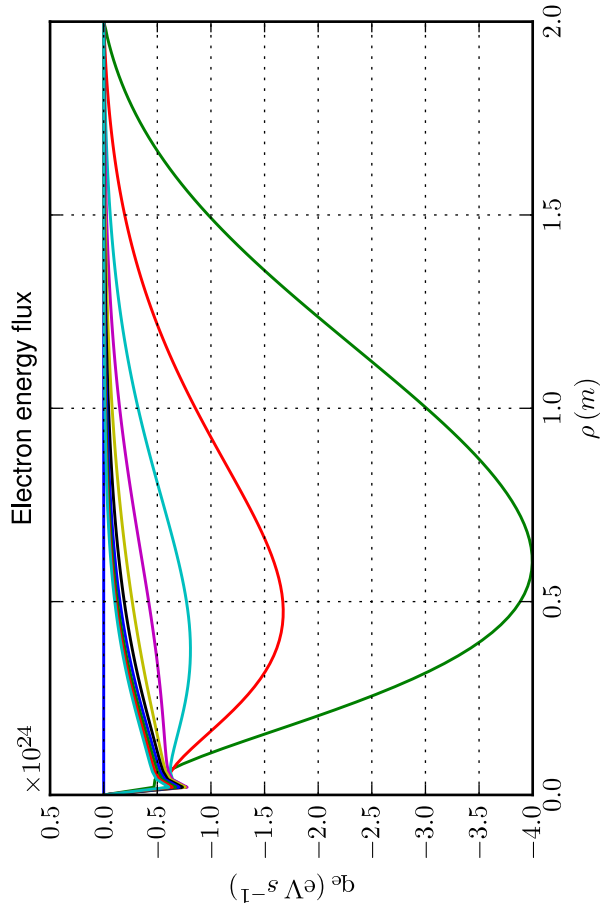
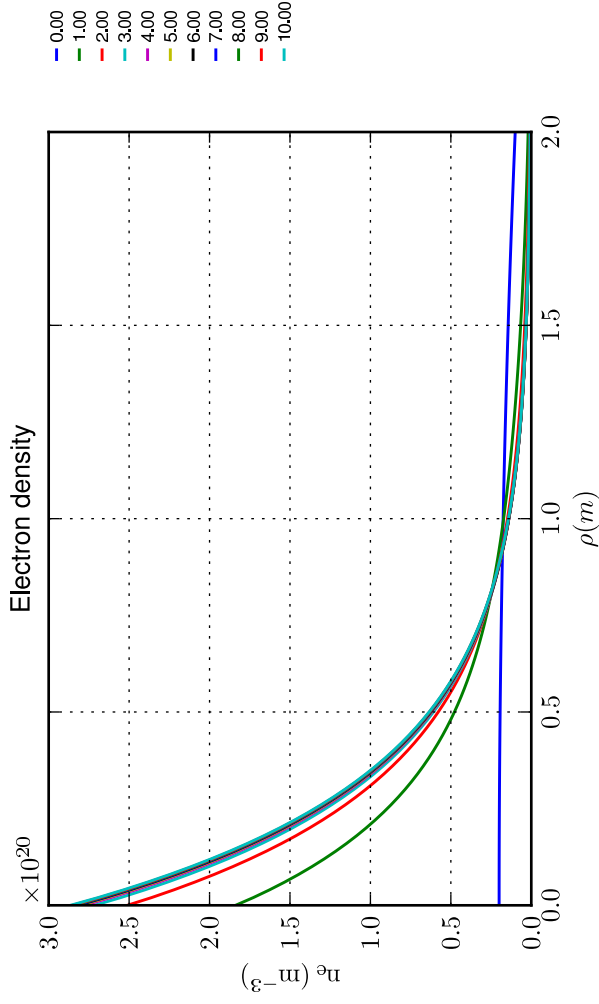
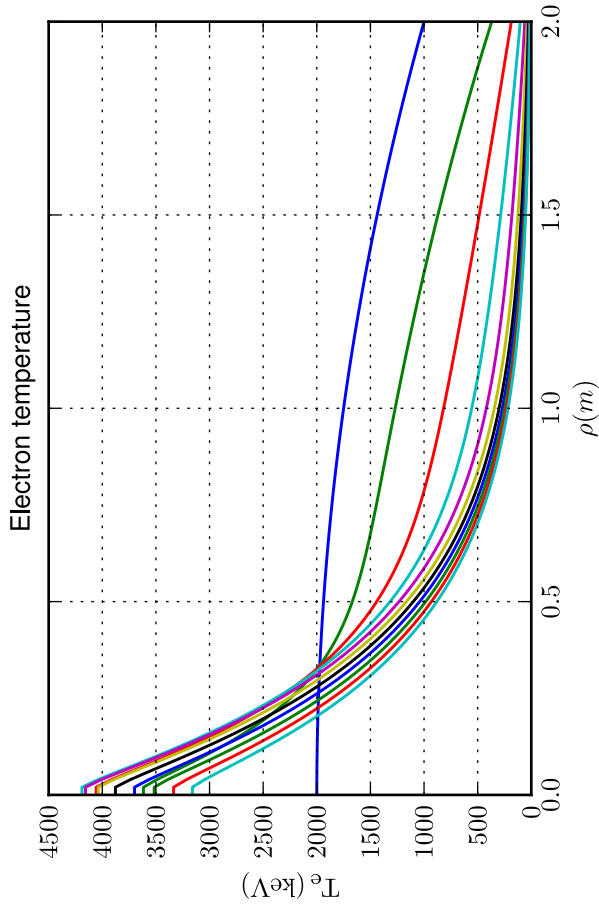


Particle conservation [Case: I.1.5.i, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = -0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_p = 101$ ]  
 Comparison with asymptotic solution (electrons and ions); total time and zoom over time



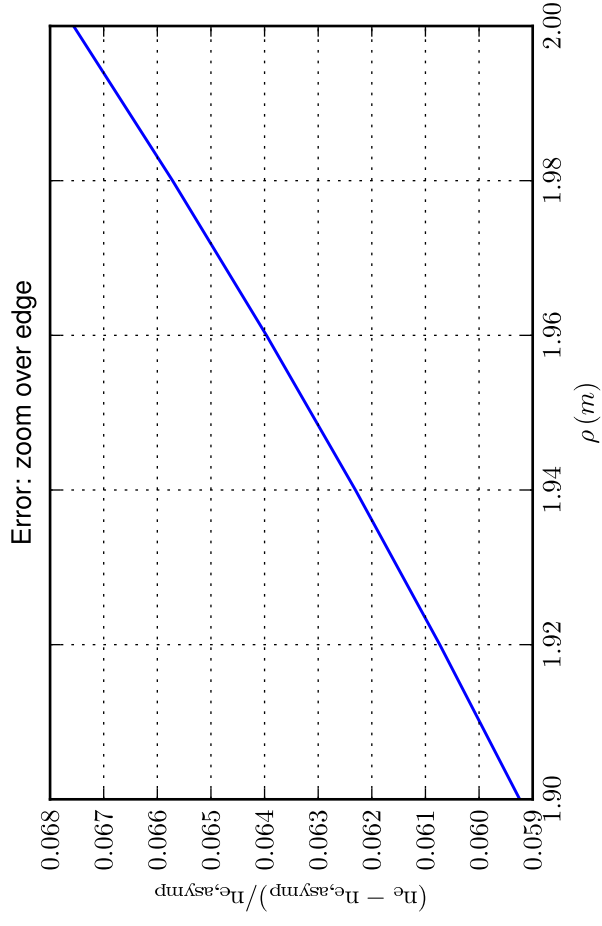
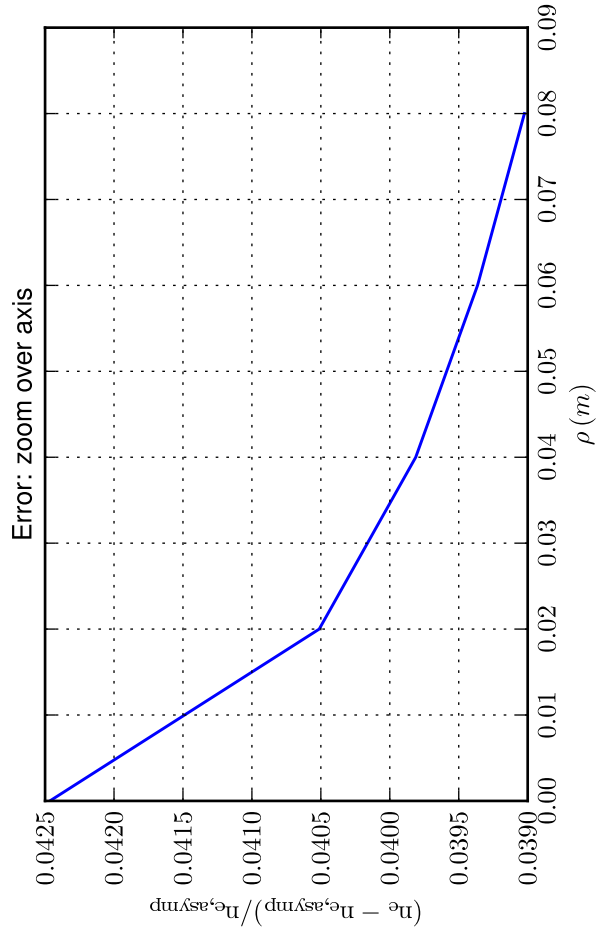
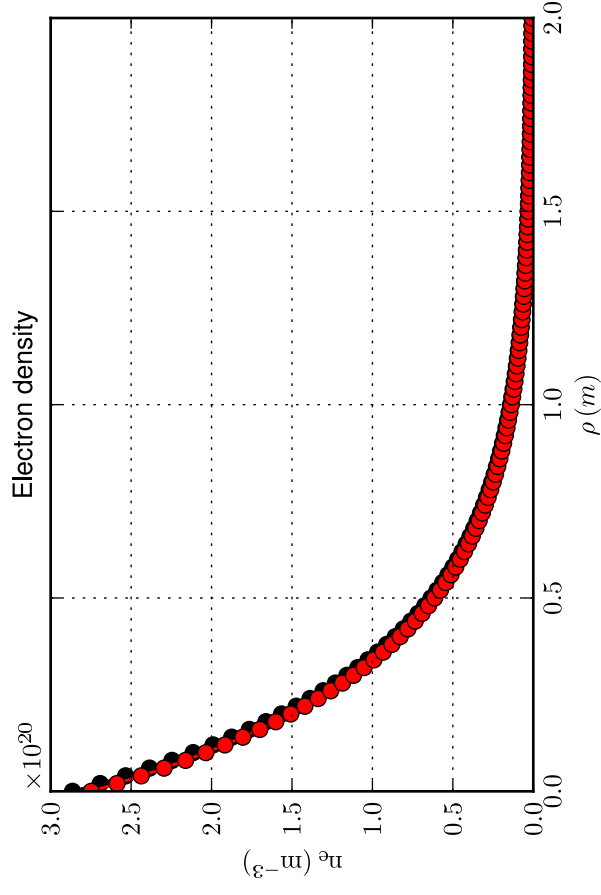
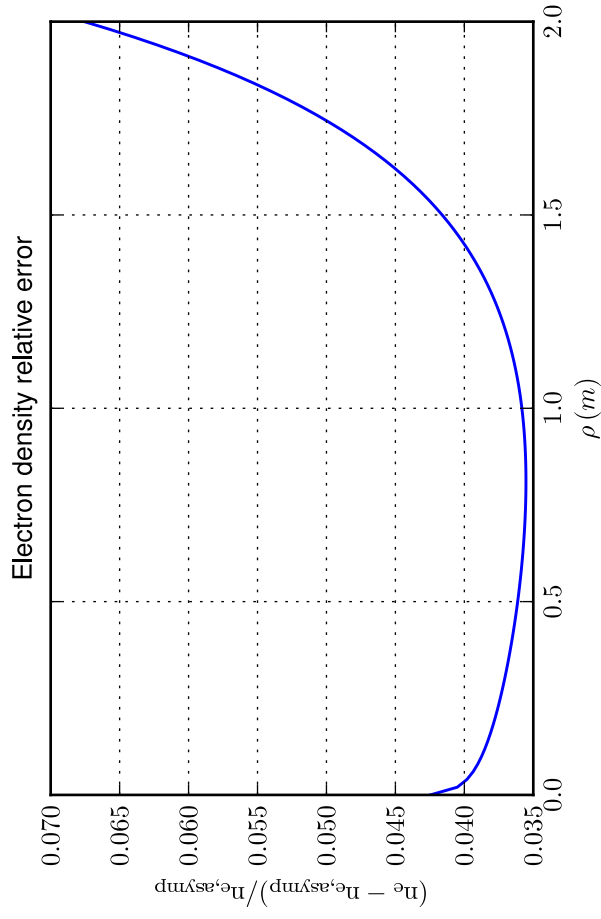
Profiles [Case: I.1.5.i, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = -0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_\rho = 101$ ]

Time sampling: total simulation time/10



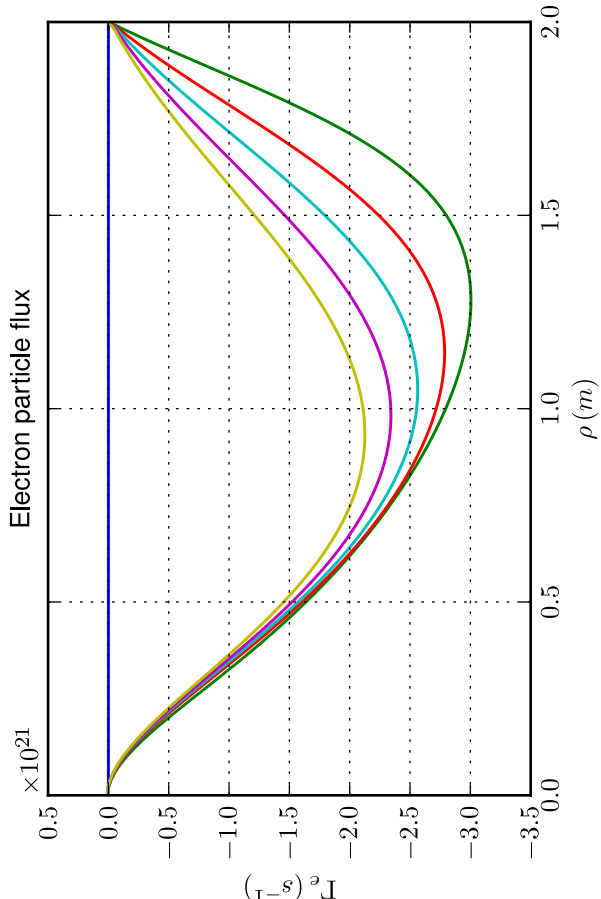
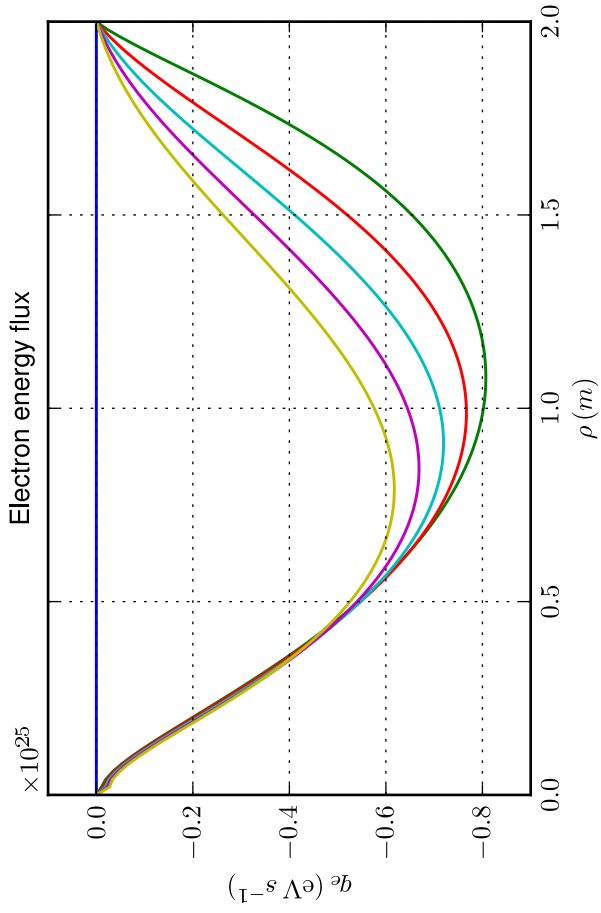
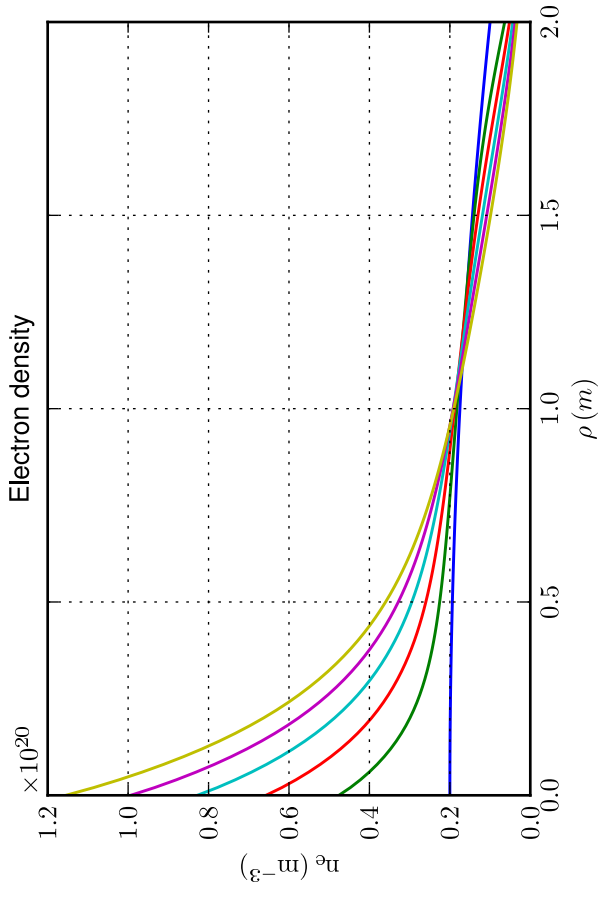
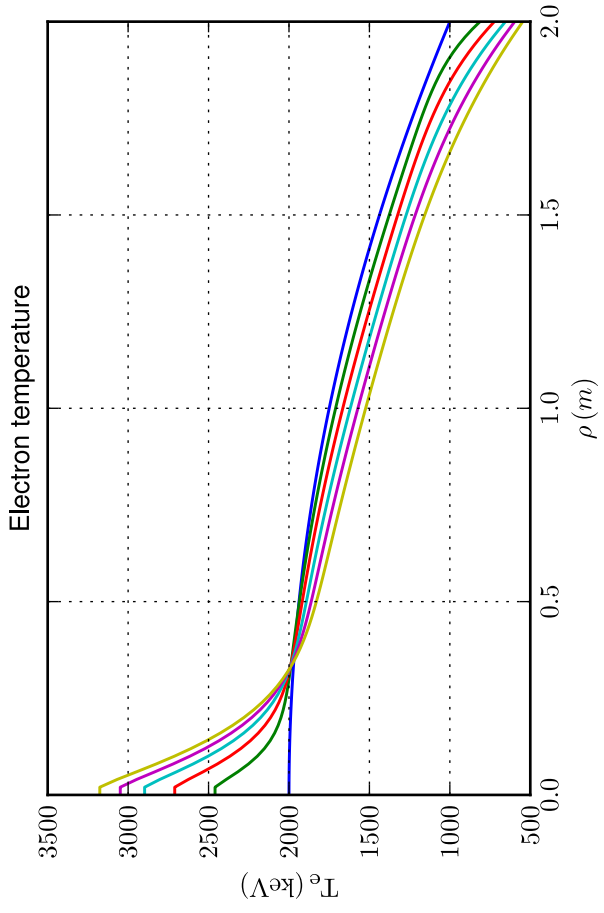
Profiles [Case: I.1.5.i, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = -0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_\rho = 101$ ]

Comparison with asymptotic solution



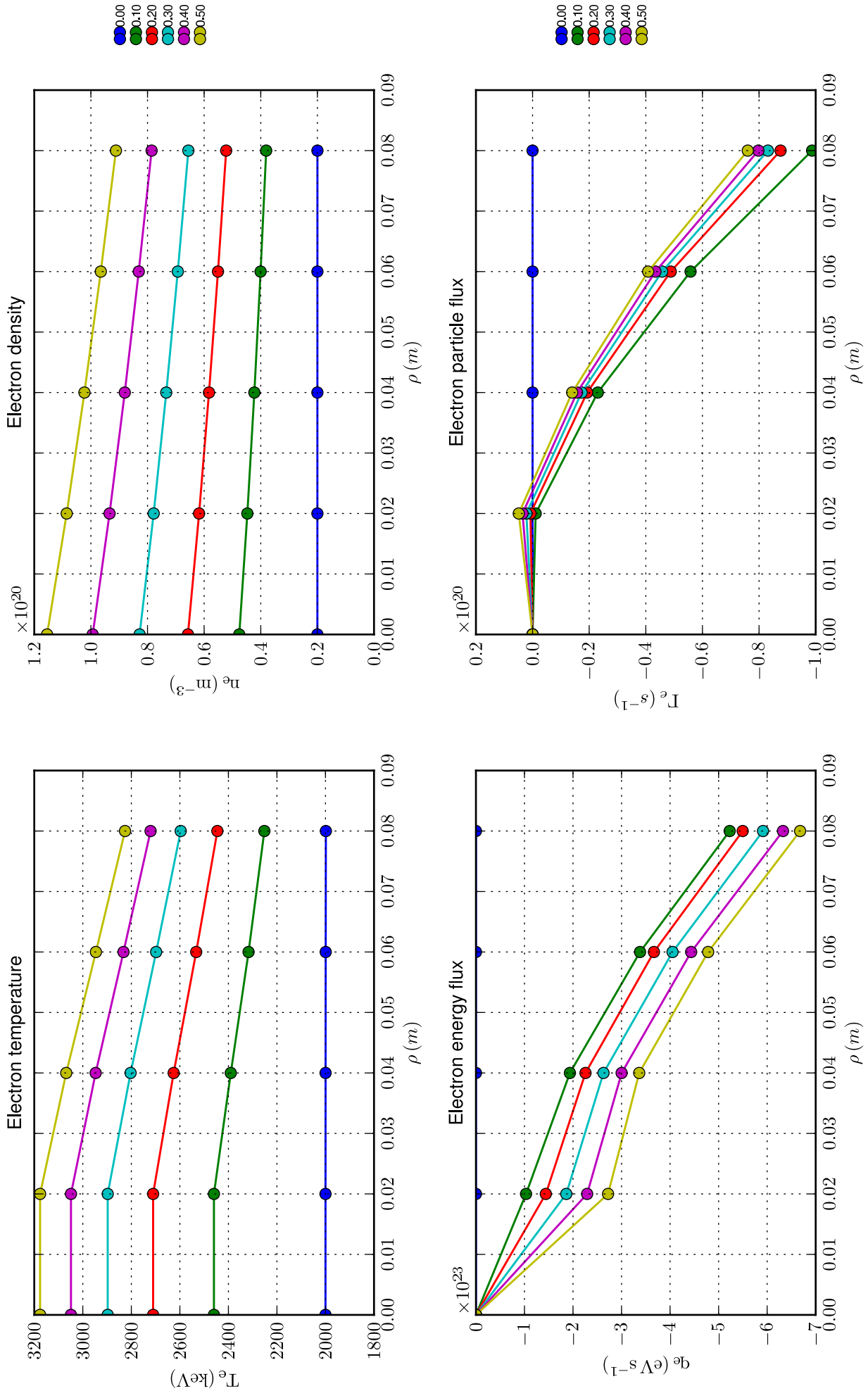
Profiles [Case: I.1.5.i, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = -0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_\rho = 101$ ]

Time sampling: first 10 time slices or zoom over time  $0.1 \times (a^2/D)/|1 - (Va/D)| = 0.57 \text{ s}$



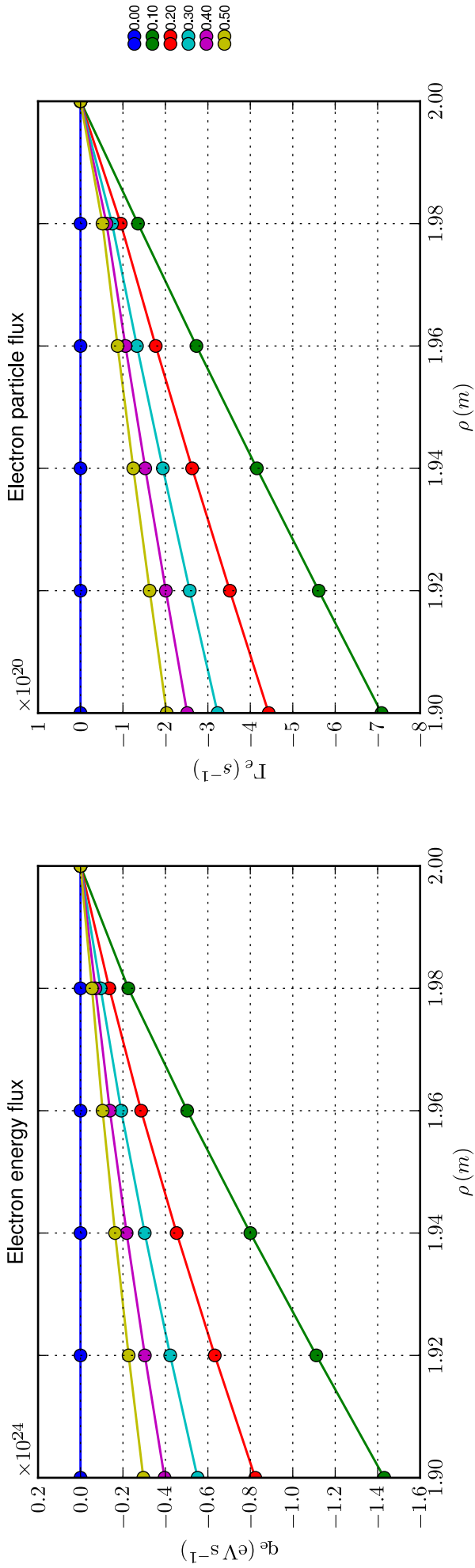
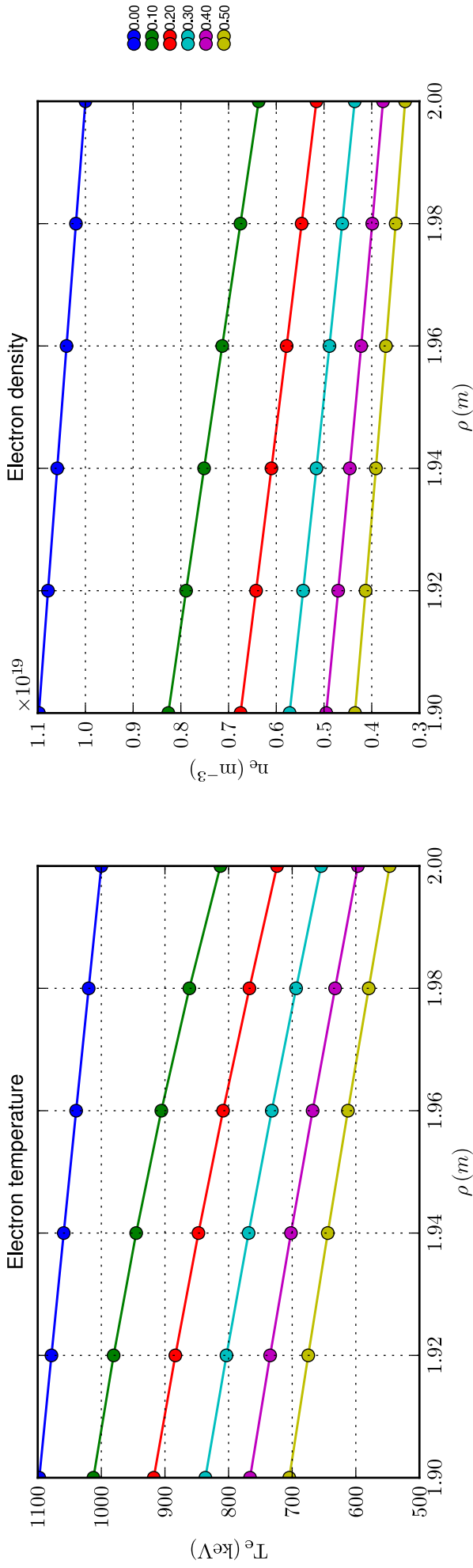
0.00  
0.10  
0.20  
0.30  
0.40  
0.50

Profiles [Case: I.1.5.i, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = -0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_\rho = 101$ ]  
 Spatial zoom over magnetic axis; time sampling: first 10 time slices or zoom over time  $0.1 \times (a^2/D)/|1 - (V_a/D)| = 0.57 \text{ s}$



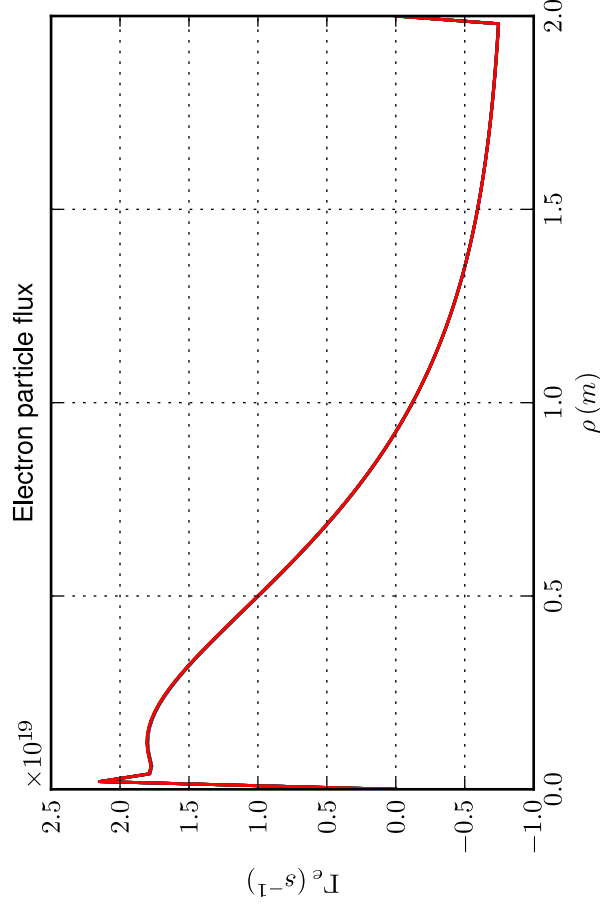
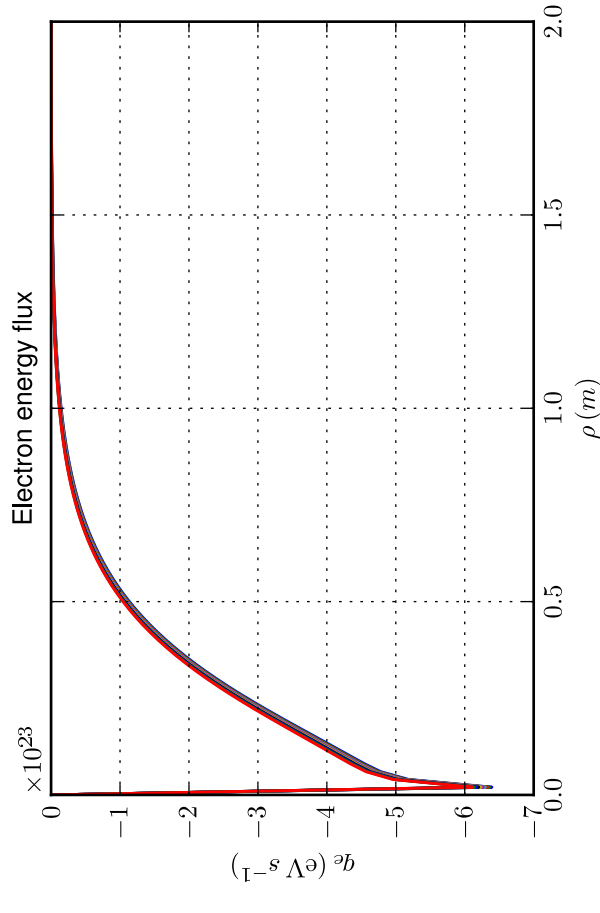
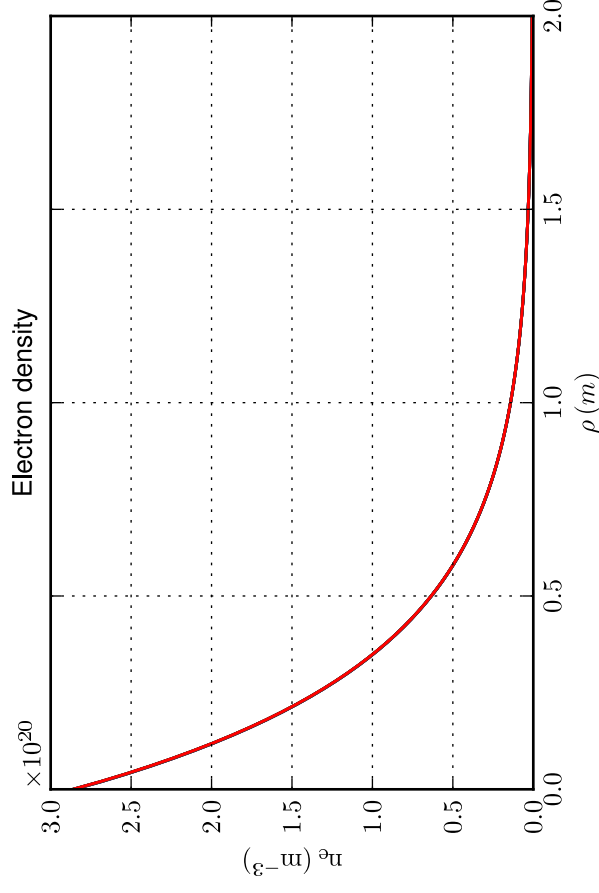
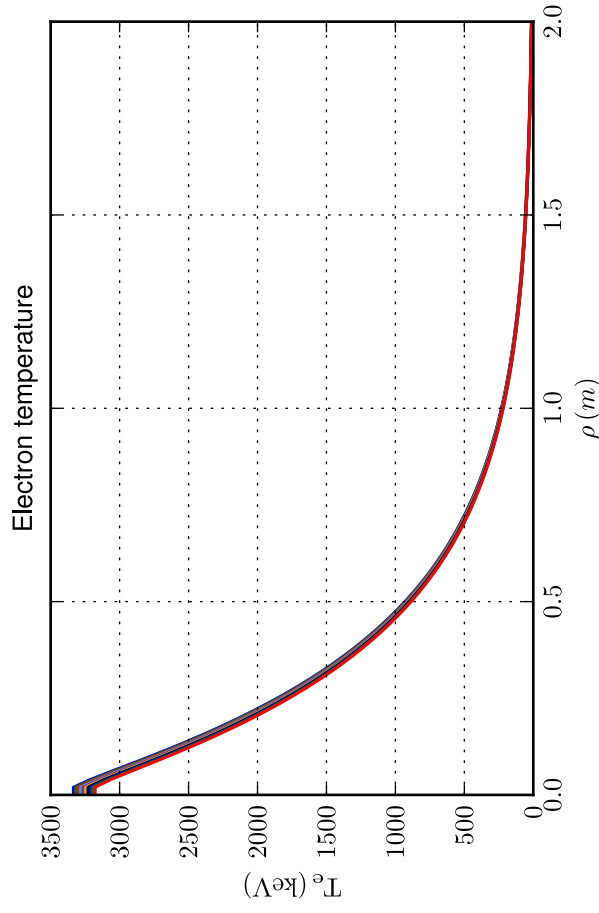


Profiles [Case: I.1.5.i, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = -0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_\rho = 101$ ]  
 Spatial zoom over edge; time sampling: first 10 time slices or zoom over time  $0.1 \times (a^2/D)/|1 - (Va/D)| = 0.57 \text{ s}$



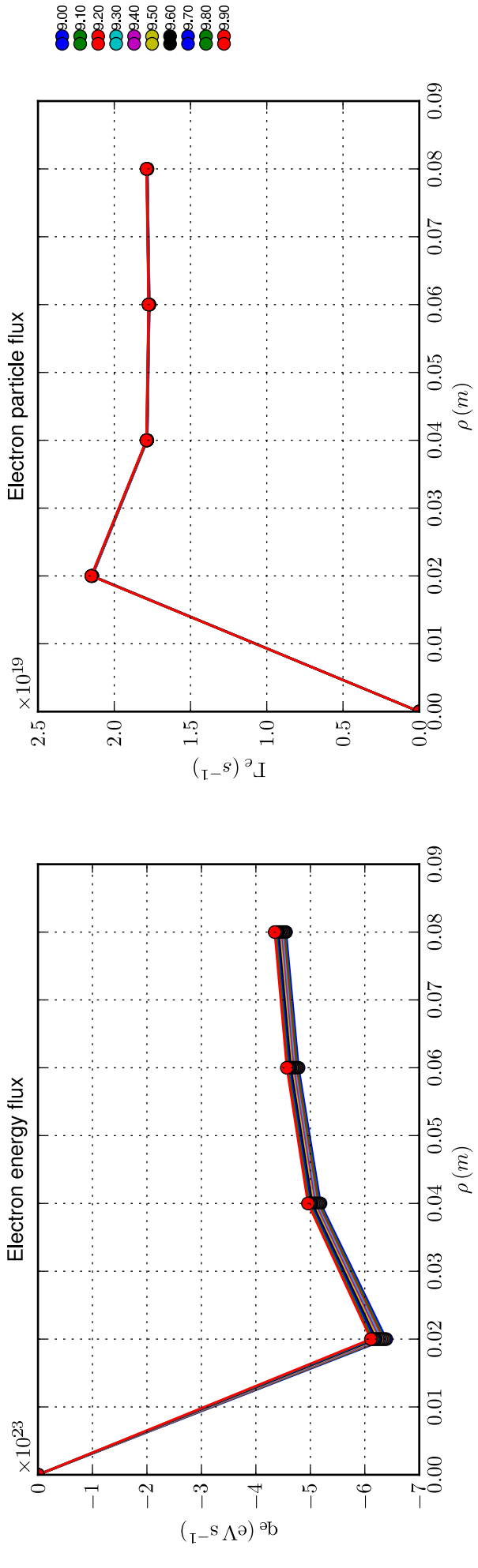
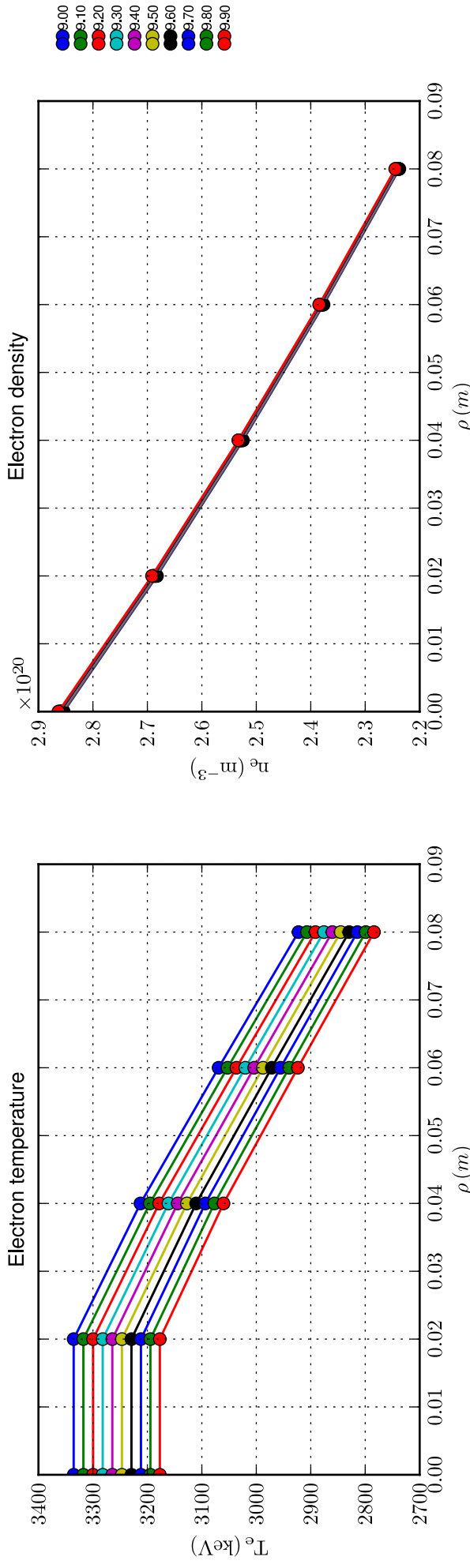
Profiles [Case: I.1.5.i, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = -0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_\rho = 101$ ]

Time sampling: last 10 time slices



9.00  
9.10  
9.20  
9.30  
9.40  
9.50  
9.60  
9.70  
9.80  
9.90

Profiles [Case: I.1.5.i, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = -0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_\rho = 101$ ]  
 Spatial zoom over magnetic axis; time sampling: last 10 time slices



Profiles [Case: I.1.5.i, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = -0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_\rho = 101$ ]

Spatial zoom over edge; time sampling: last 10 time slices

