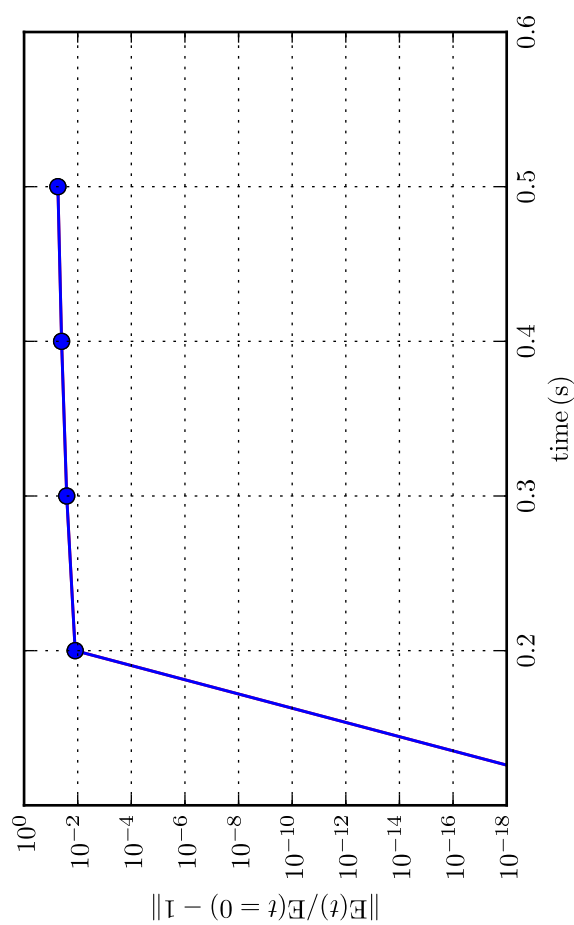
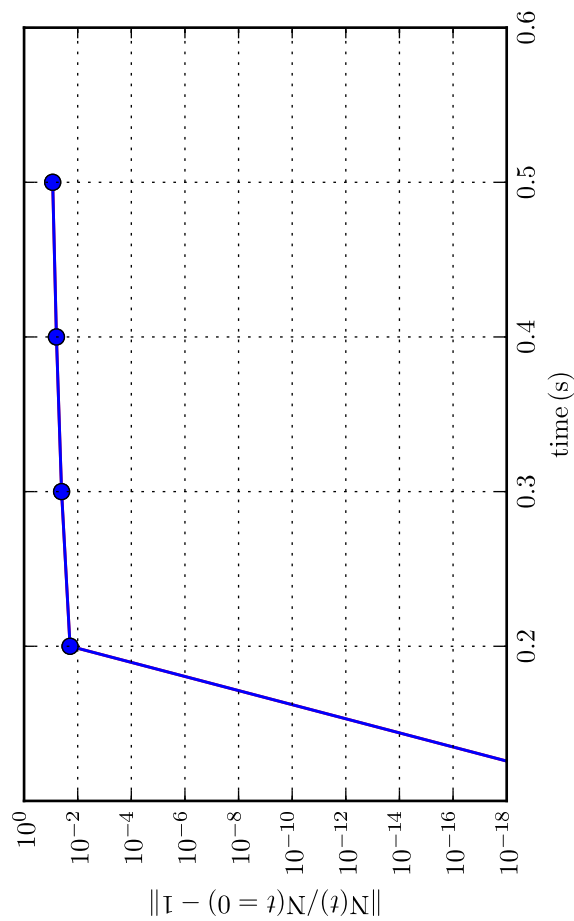
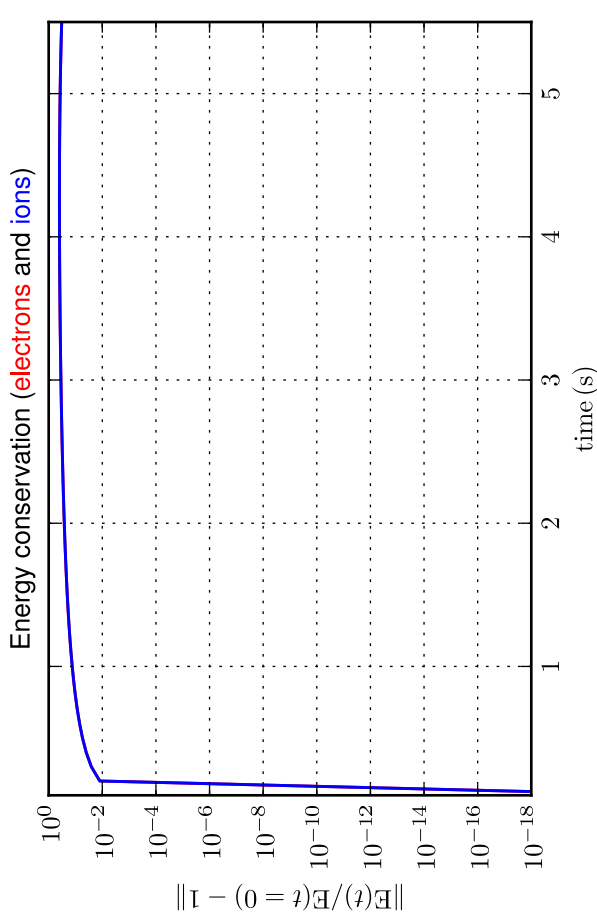
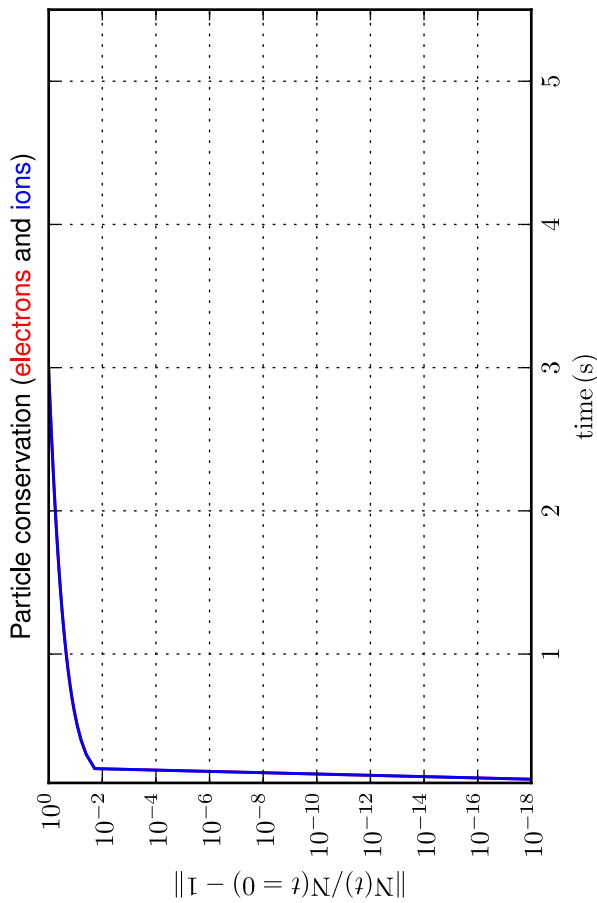
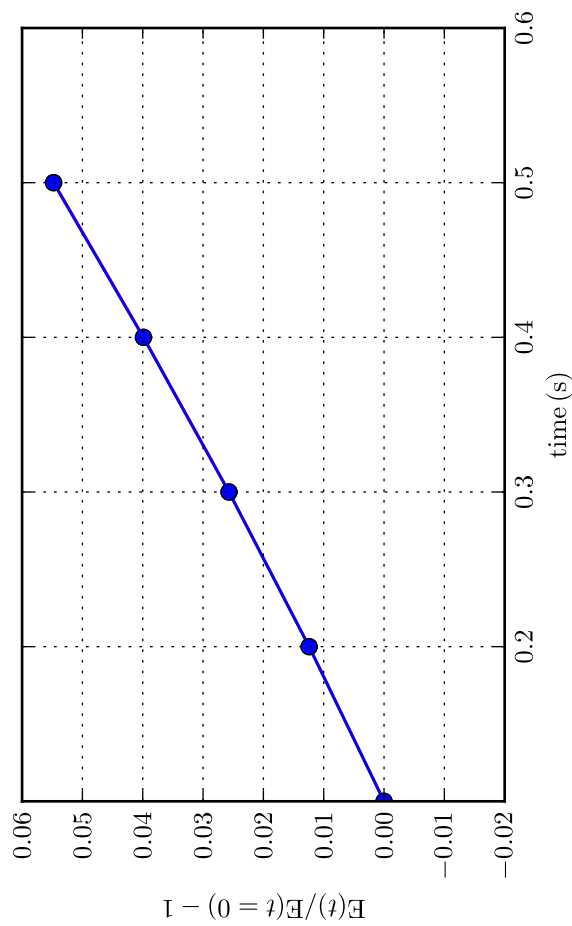
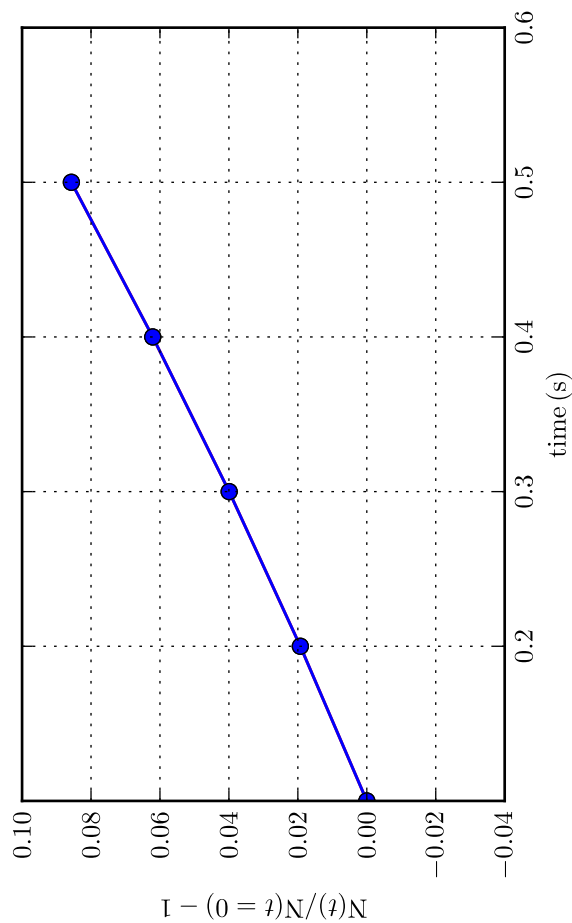
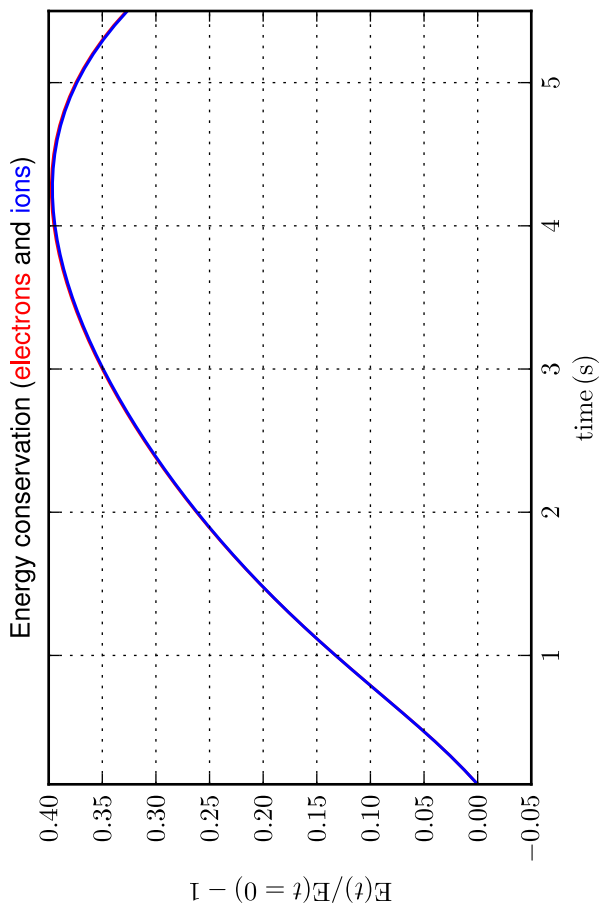
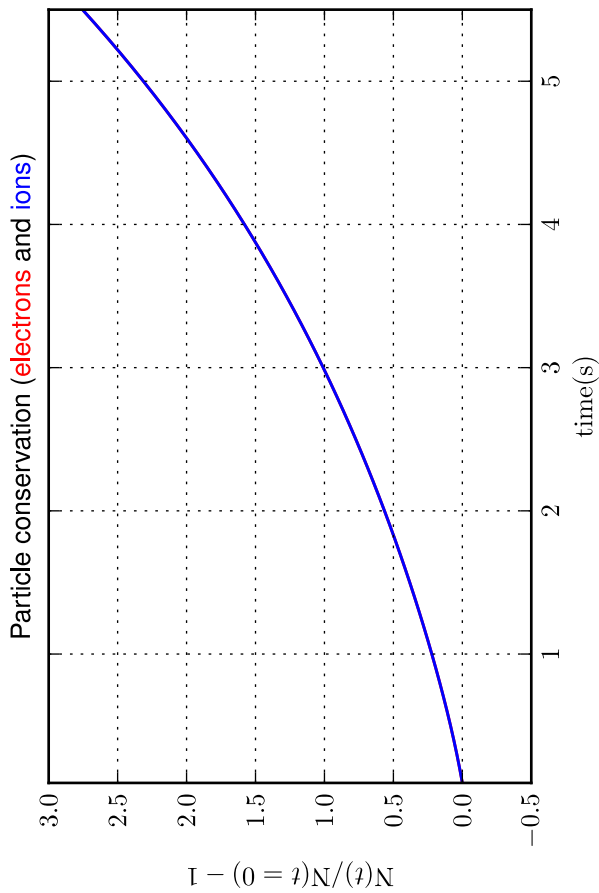


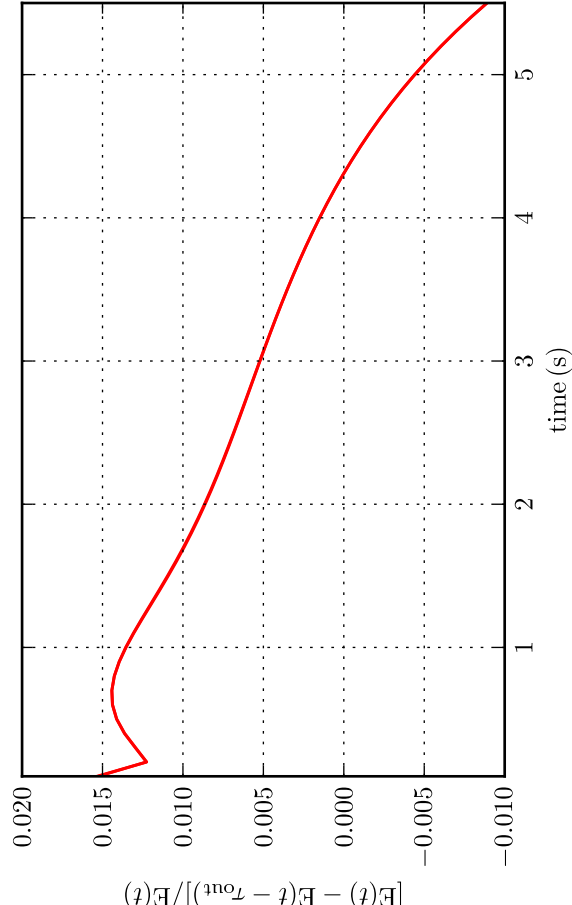
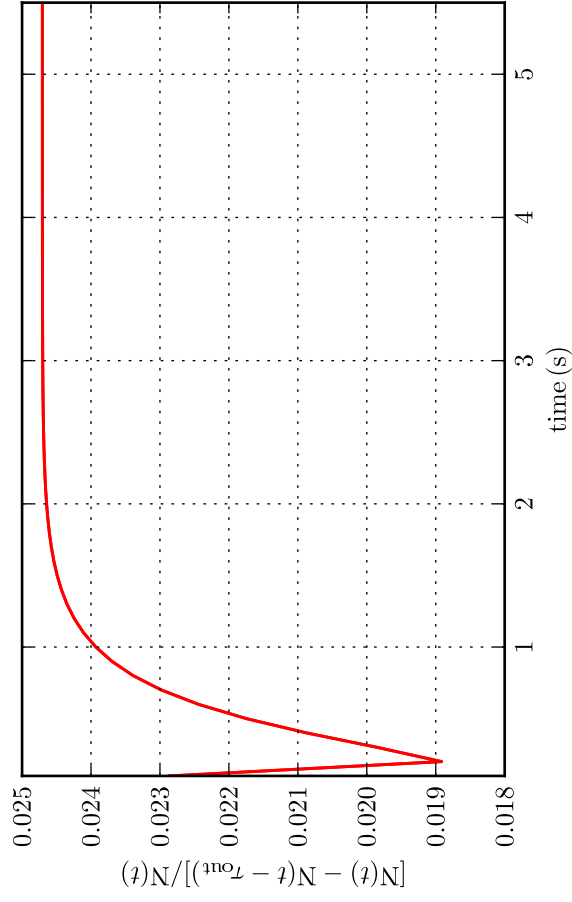
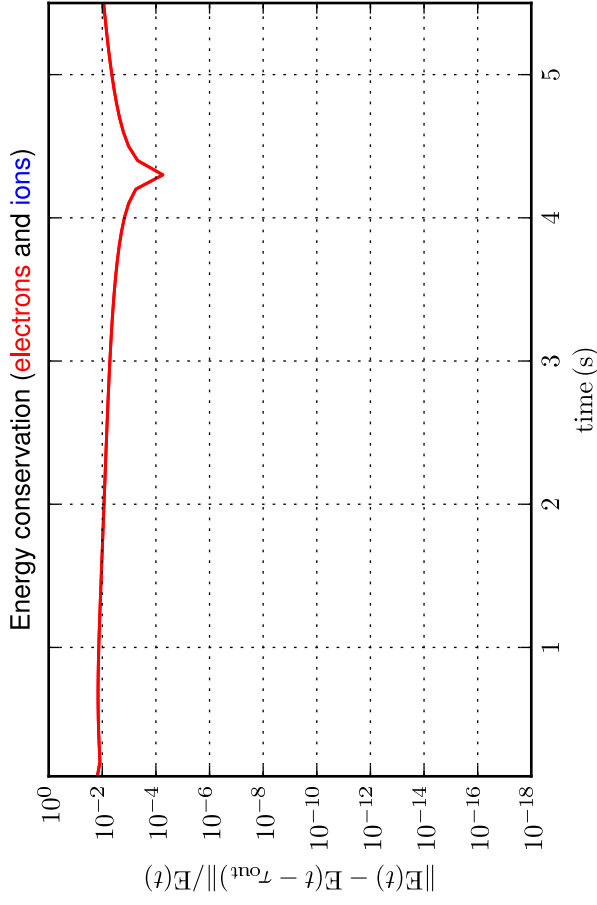
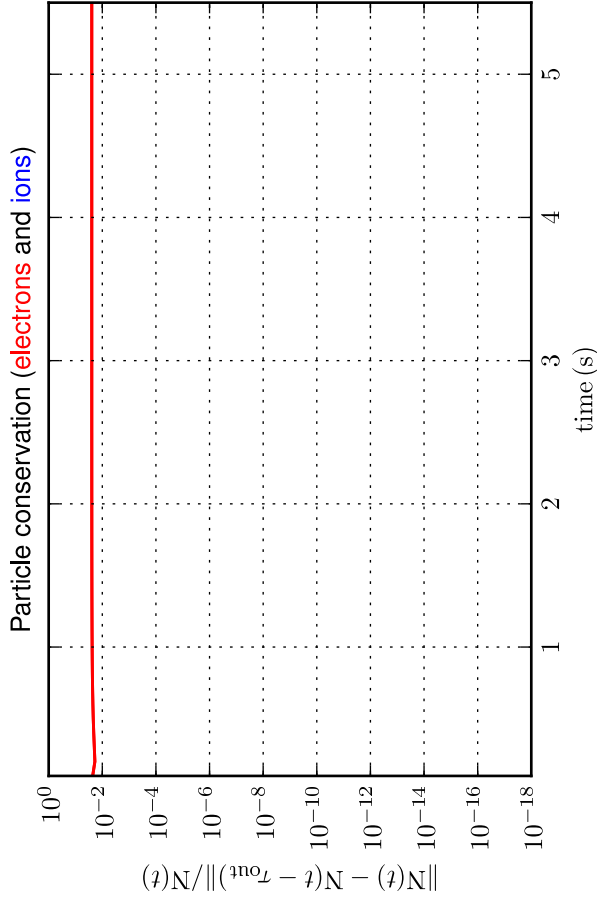
Part. & Energy conservation [Case: I.1.5.b, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_p = 101$ ]  
 Comparison with initial solution - log scale; total time and zoom over time



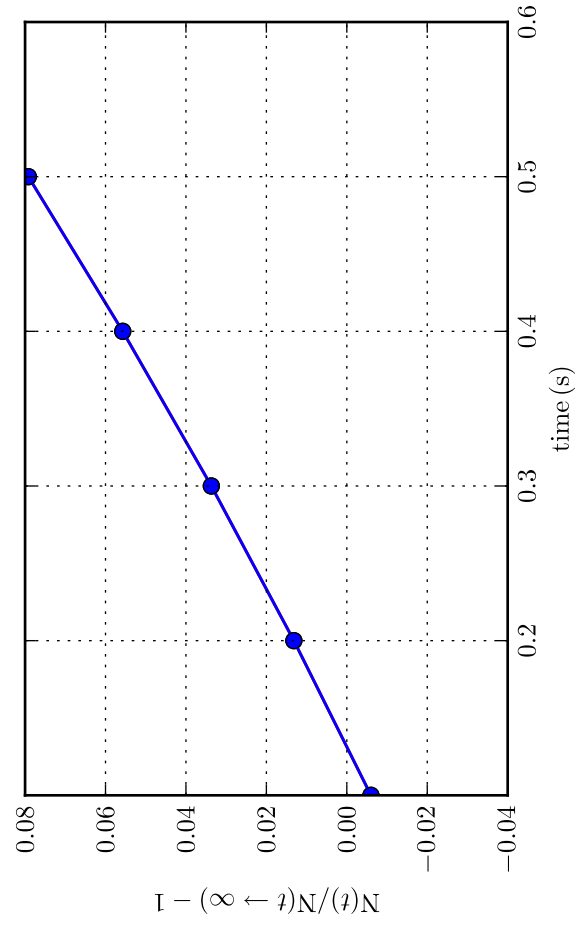
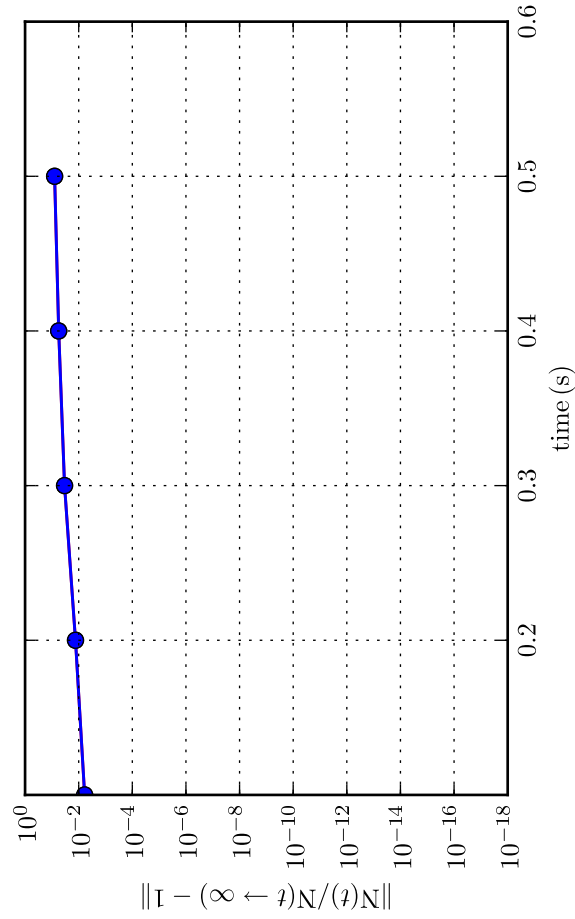
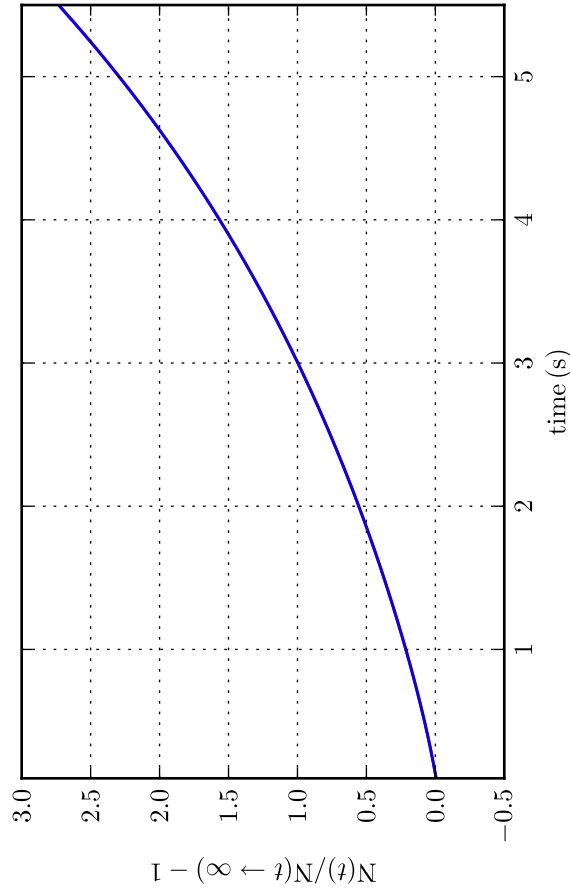
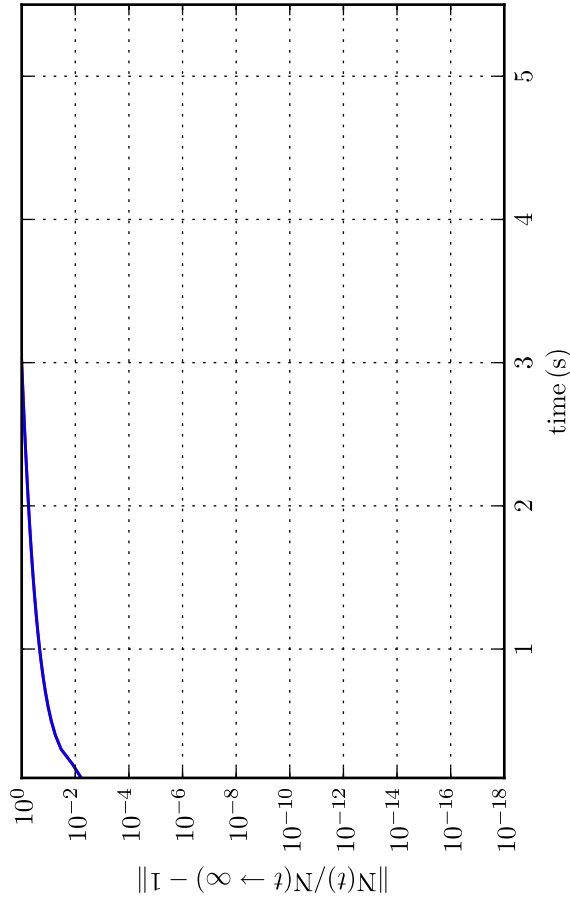
Part. & Energy conservation [Case: 1.1.5.b, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_p = 101$ ]  
 Comparison with initial solution - linear scale; total time and zoom over time



Part. & Energy conservation [Case: I.1.5.b, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_p = 101$ ]  
 Comparison with previous time-sampled ( $\tau_{\text{out}}$ ) solution - log and linear scales

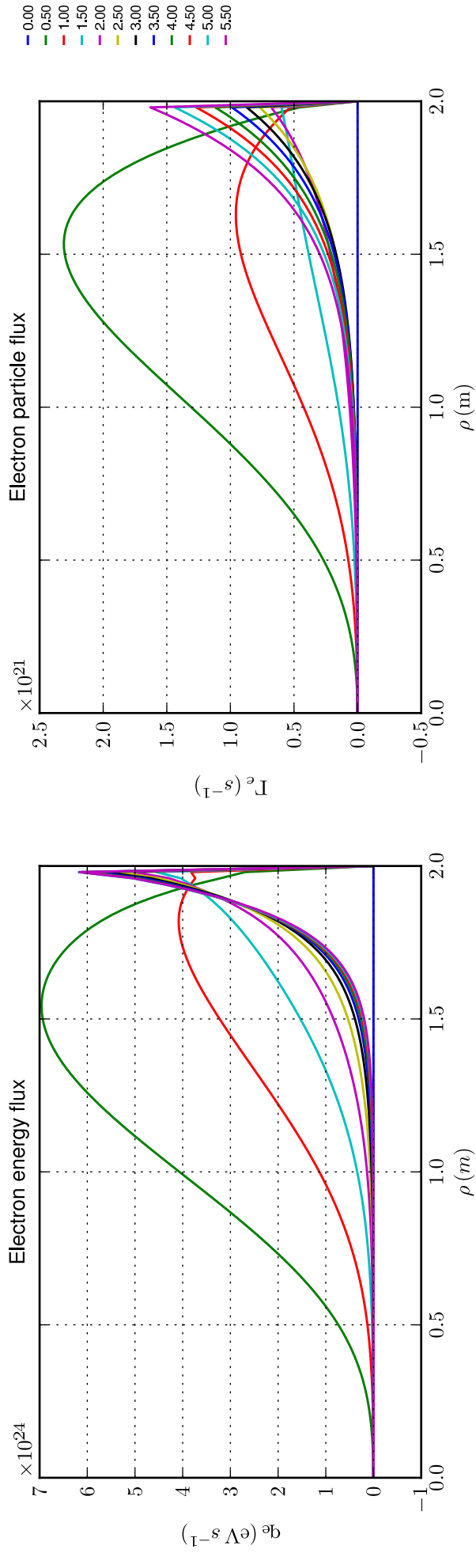
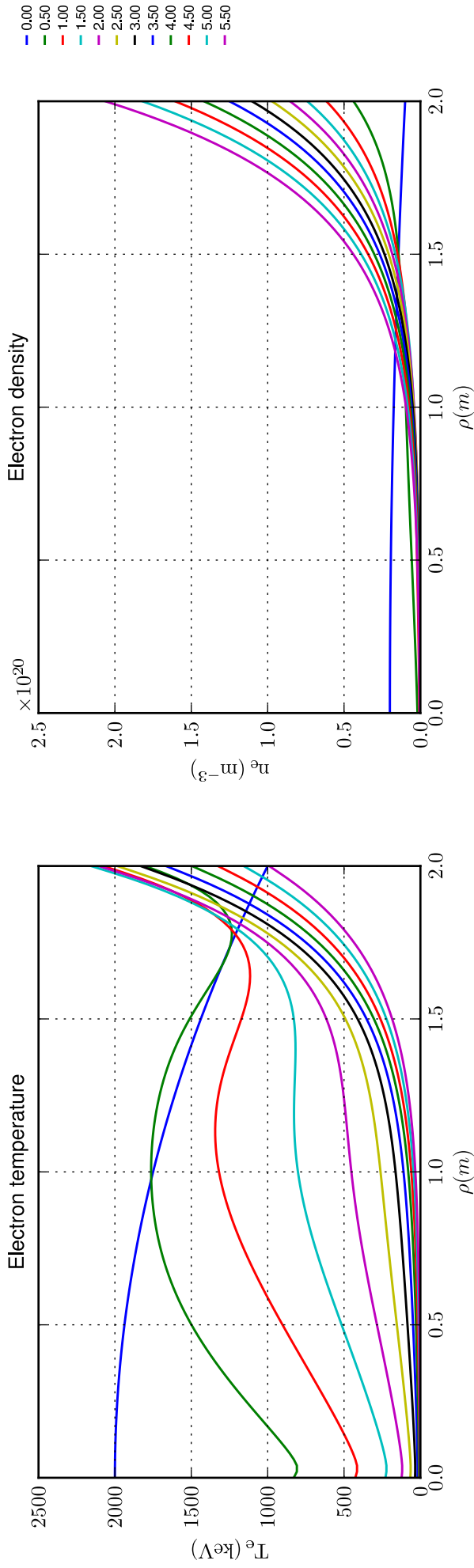


Particle conservation [Case: 1.1.5.b, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_p = 101$ ]  
 Comparison with asymptotic solution (electrons and ions); total time and zoom over time



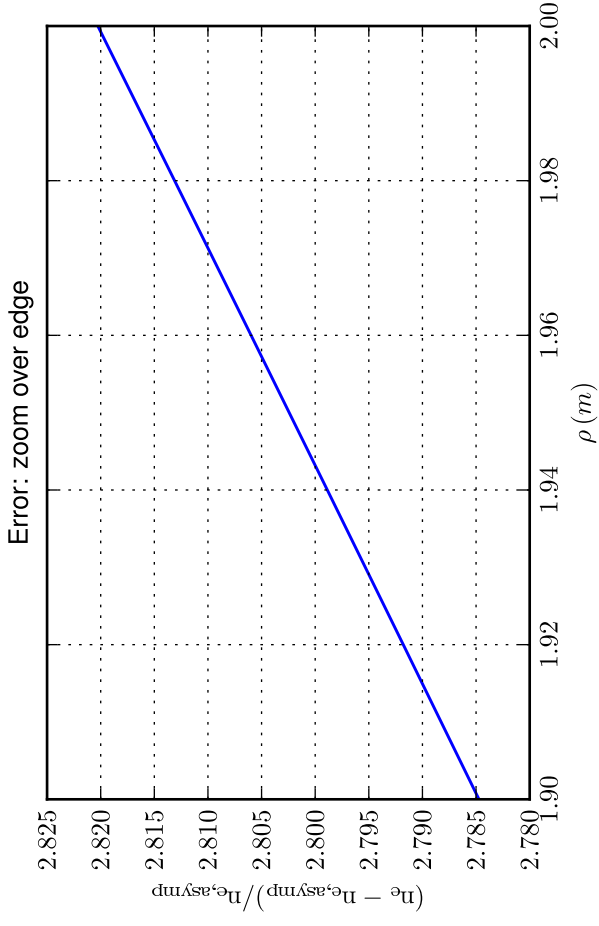
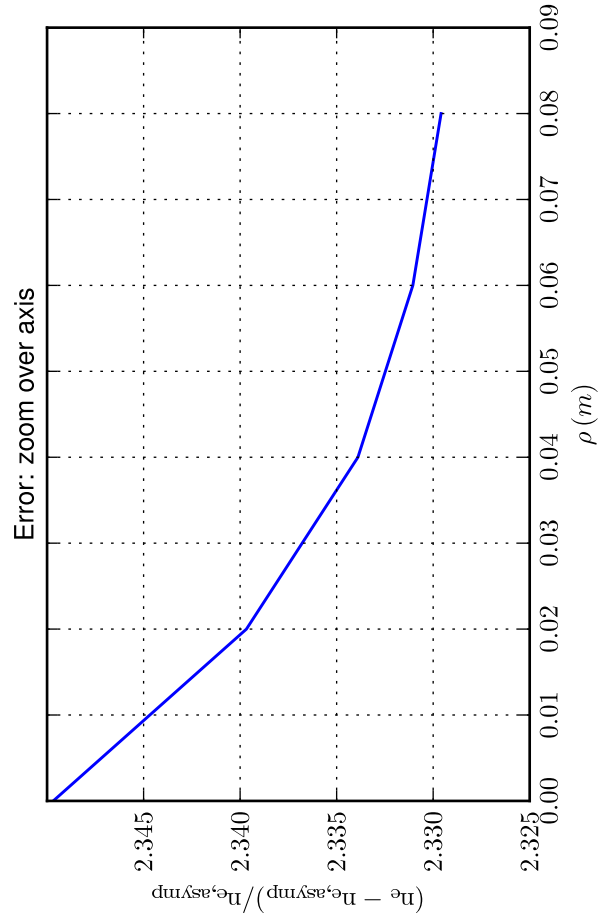
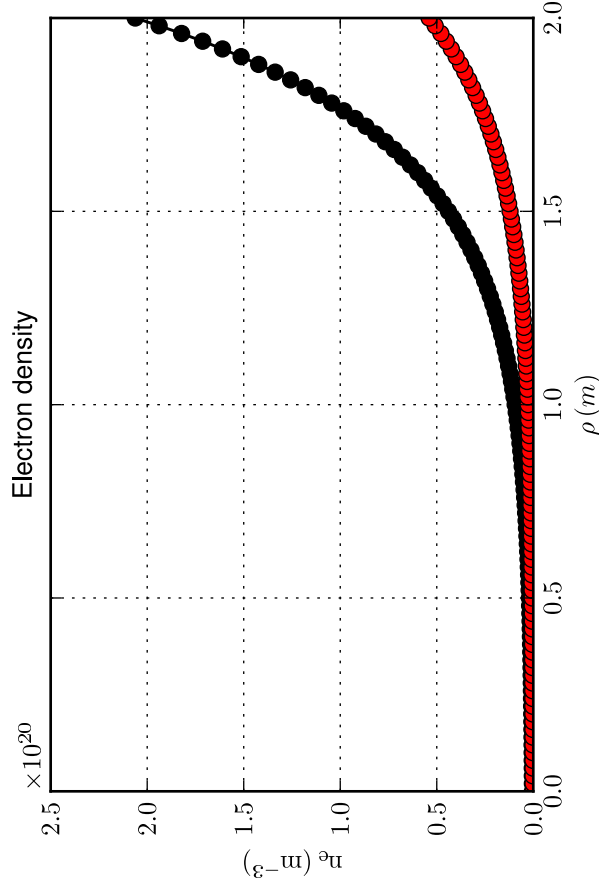
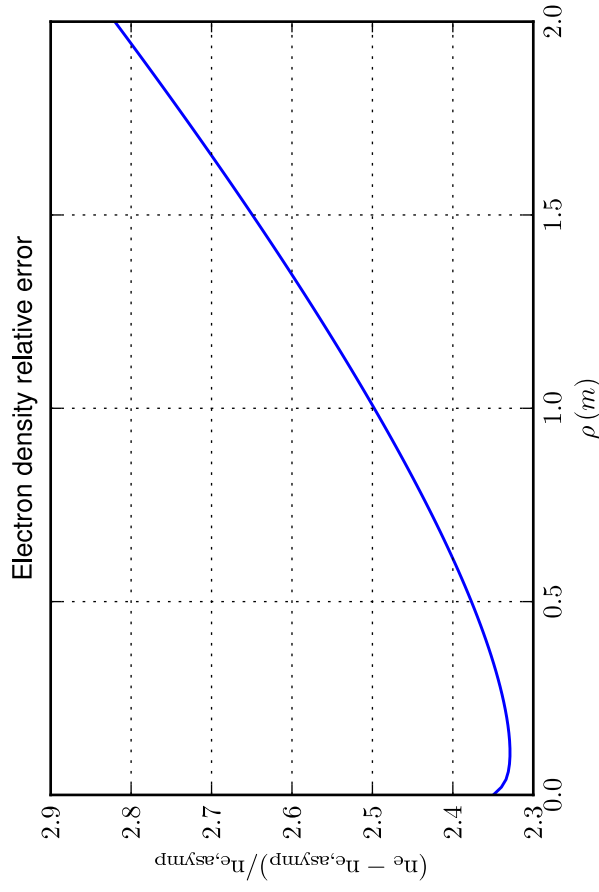
Profiles [Case: 1.1.5.b, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]

Time sampling: total simulation time/10



Profiles [Case: I.1.5.b, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]

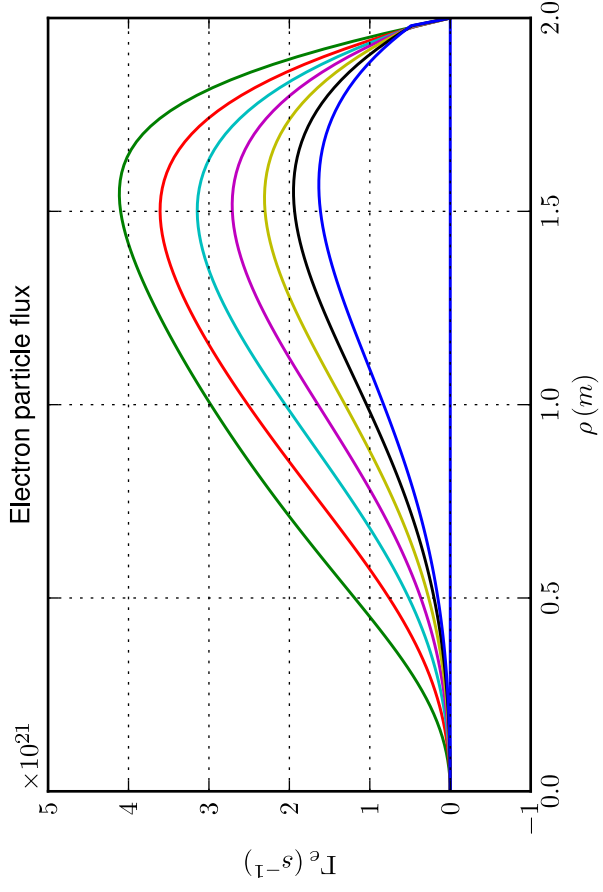
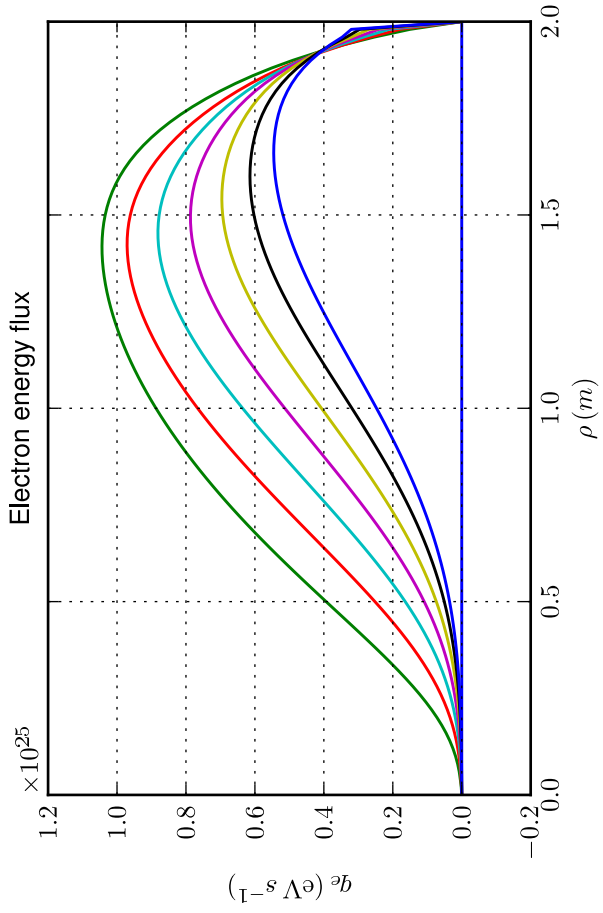
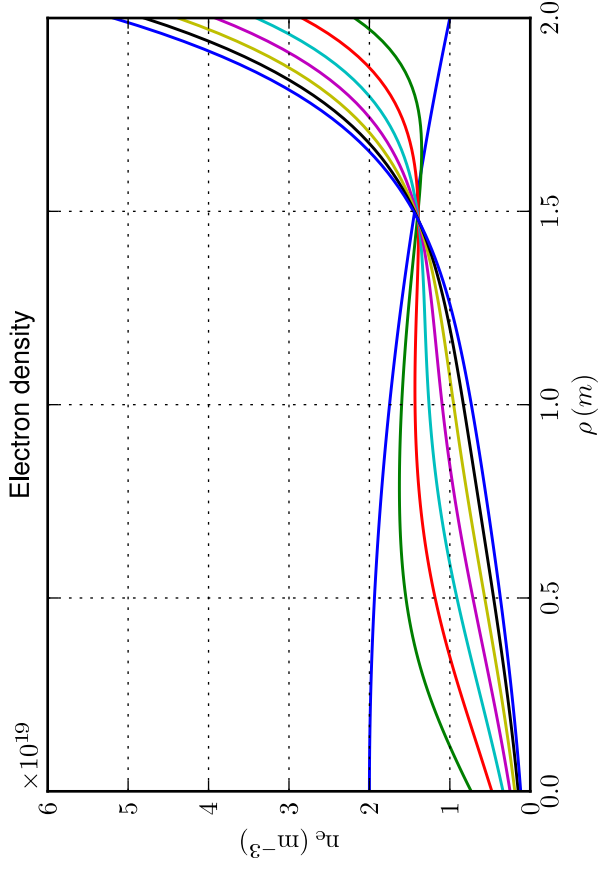
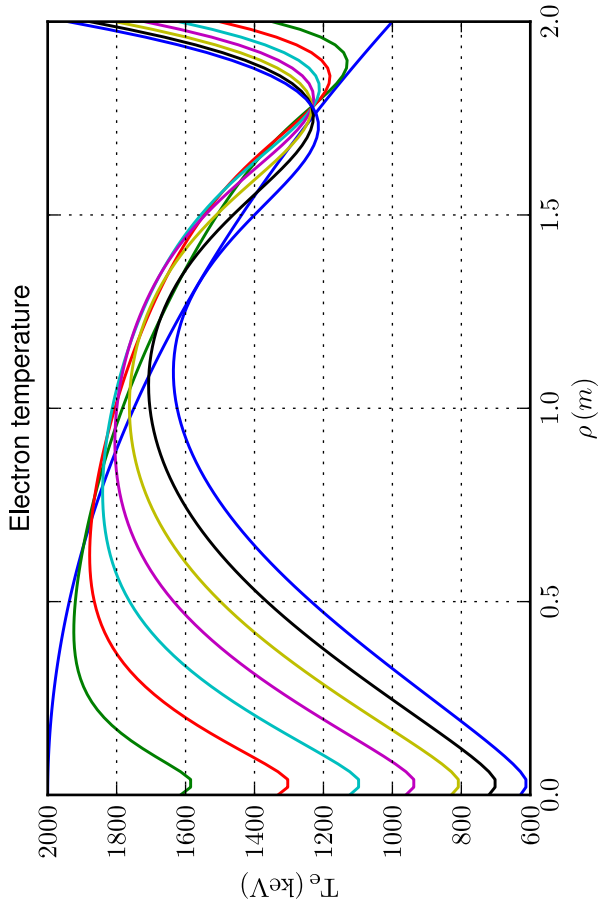
Comparison with asymptotic solution



● final calculation  
● asymptotic

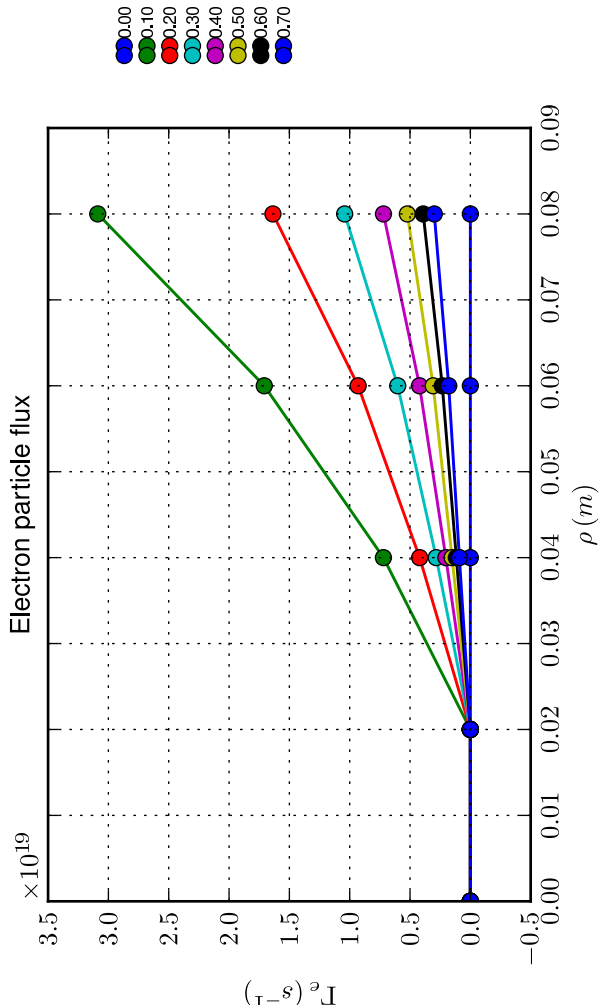
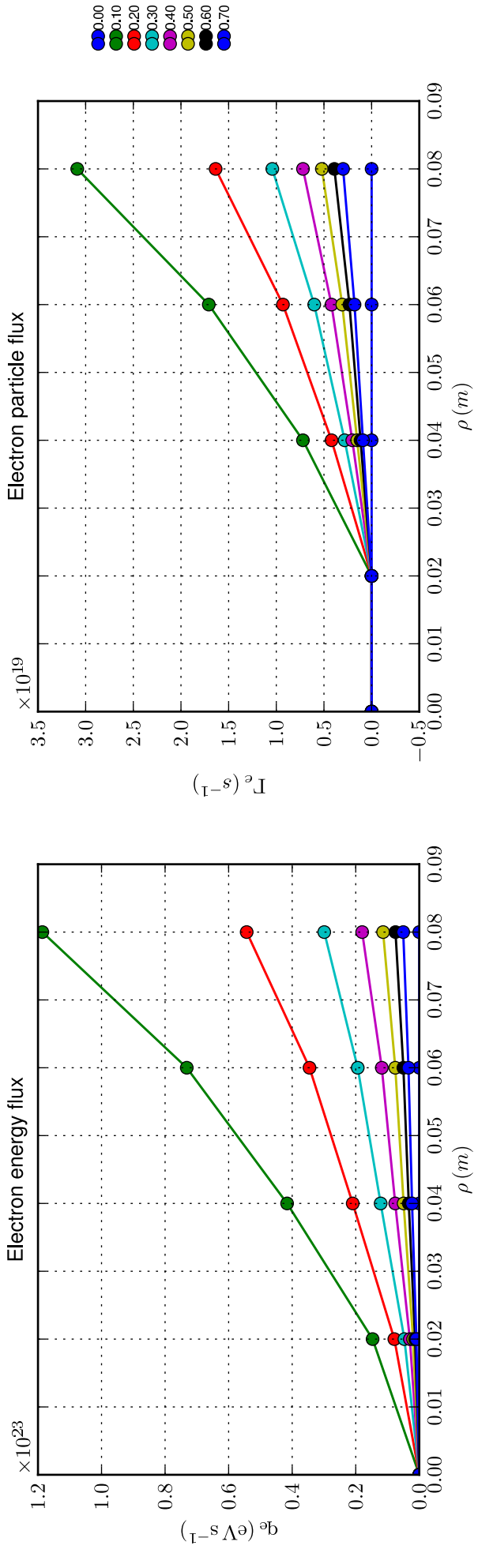
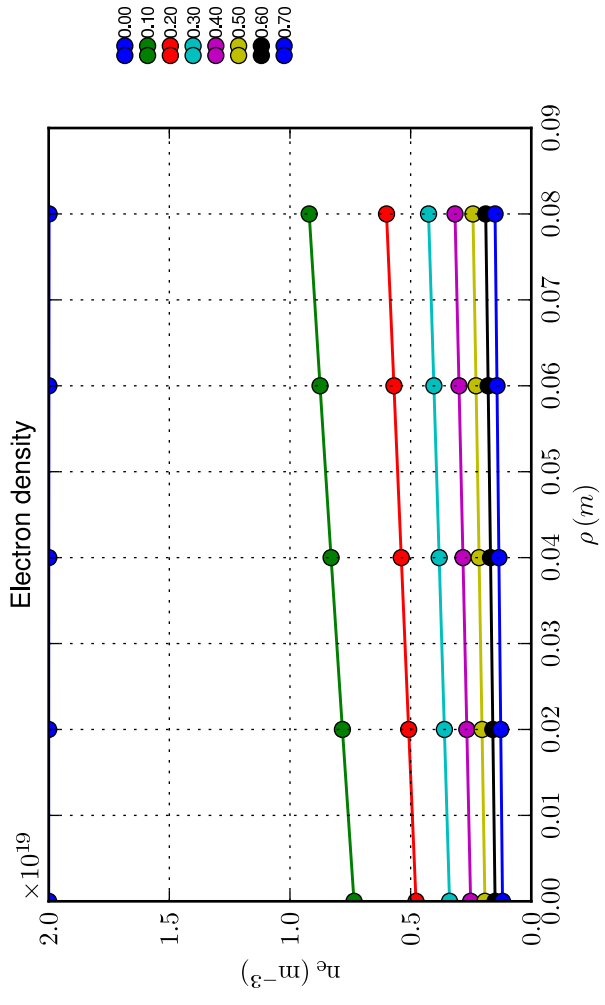
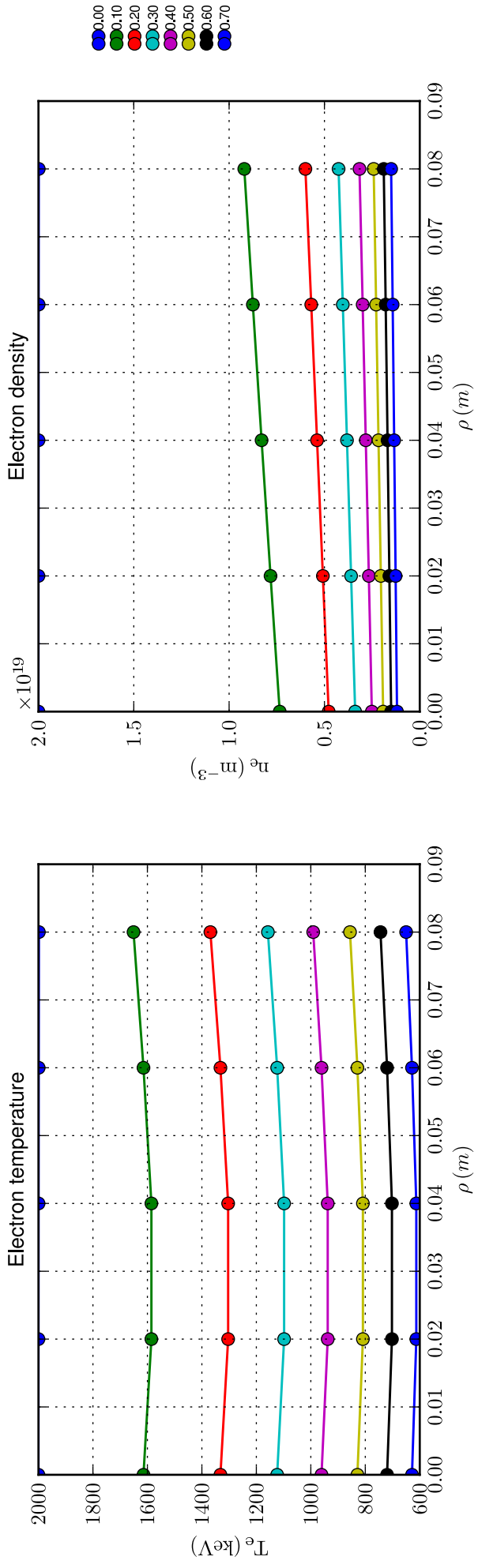
Profiles [Case: 1.1.5.b, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]

Time sampling: first 10 time slices or zoom over time  $0.1 \times (a^2/D)/|1 - (V a/D)| = 0.80 \text{ s}$



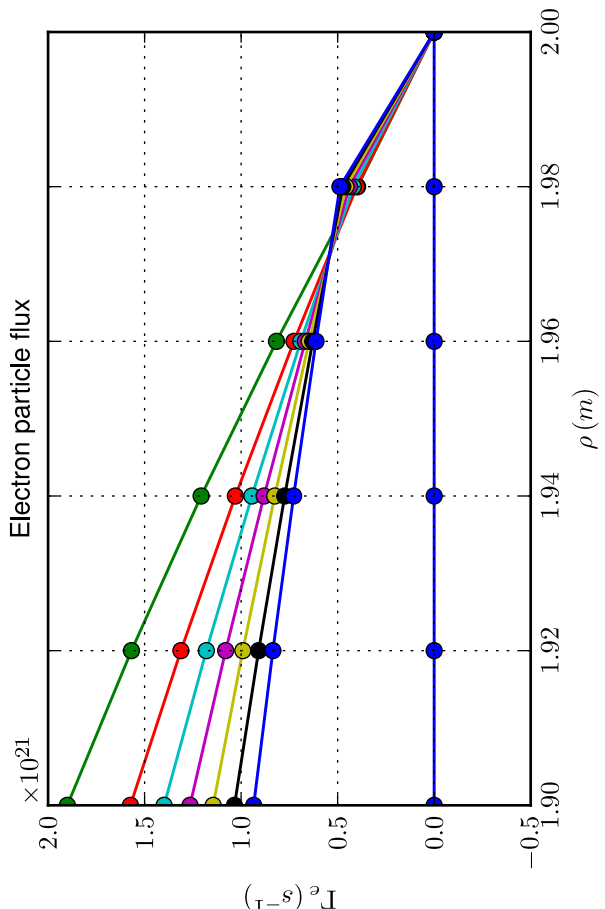
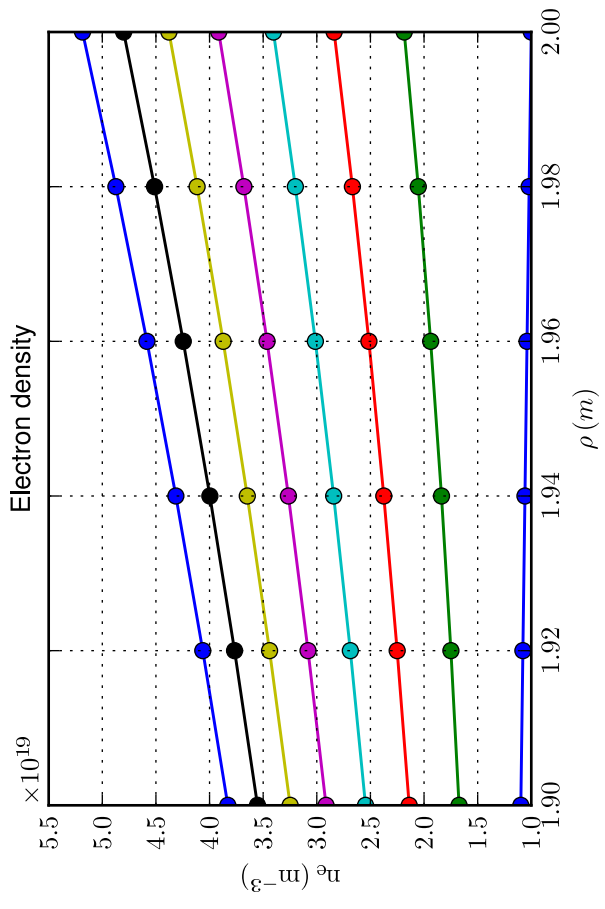
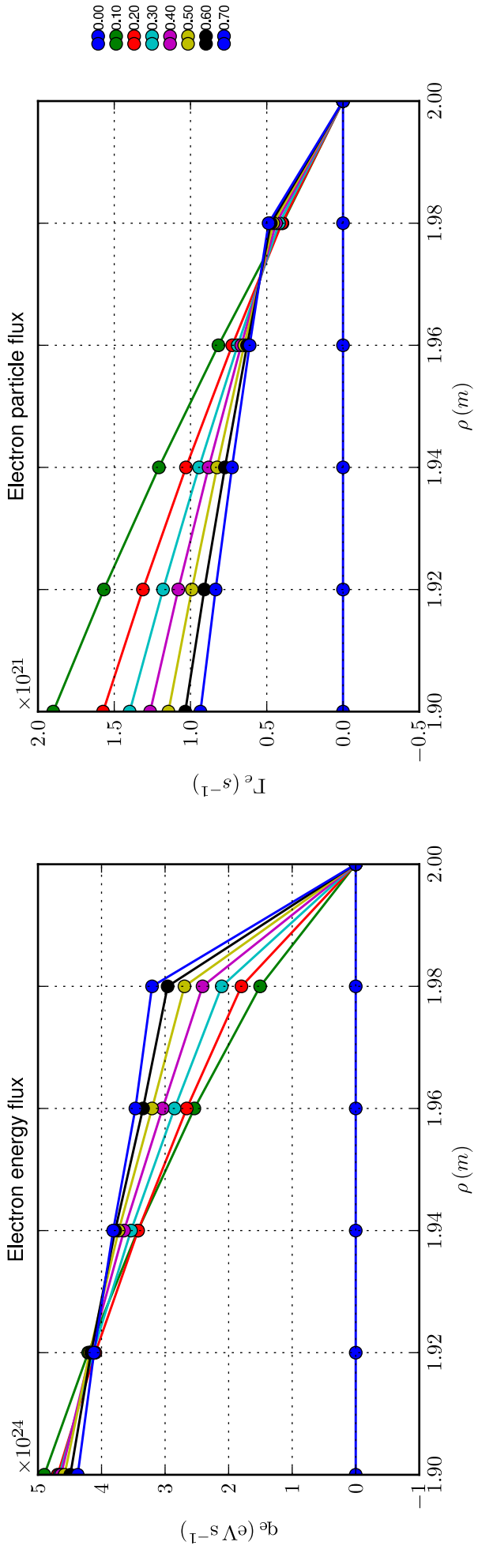
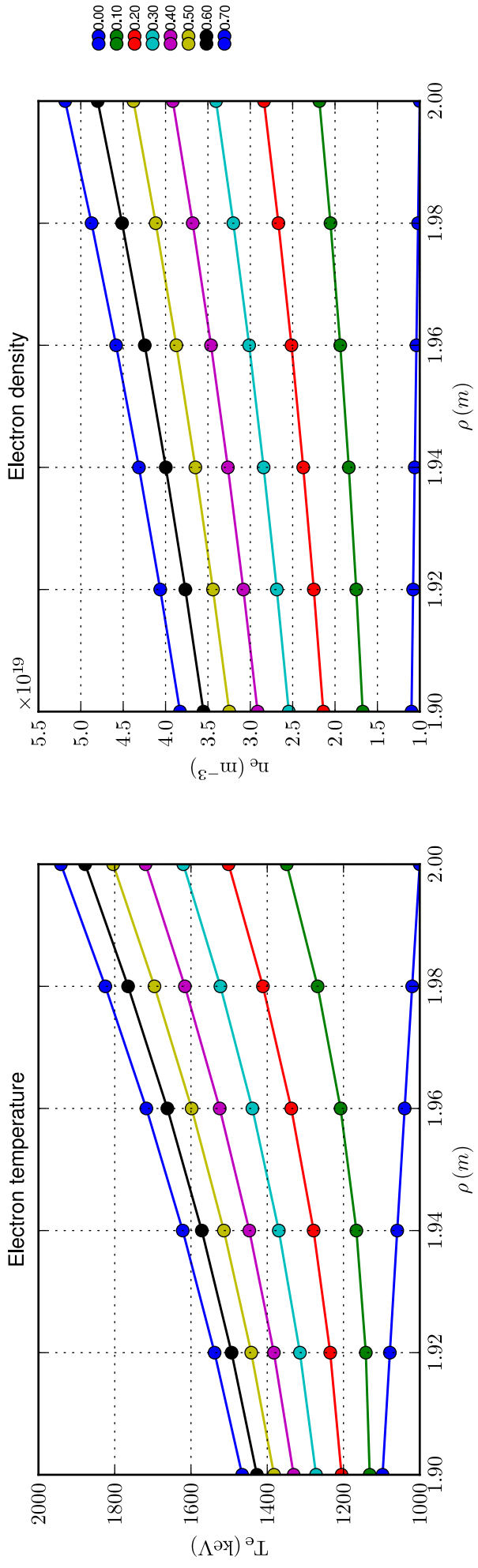
0.00  
0.10  
0.20  
0.30  
0.40  
0.50  
0.60  
0.70

Profiles [Case: I.1.5.b, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]  
 Spatial zoom over magnetic axis; time sampling: first 10 time slices or zoom over time  $0.1 \times (a^2/D)/|1 - (V_a/D)| = 0.80 \text{ s}$





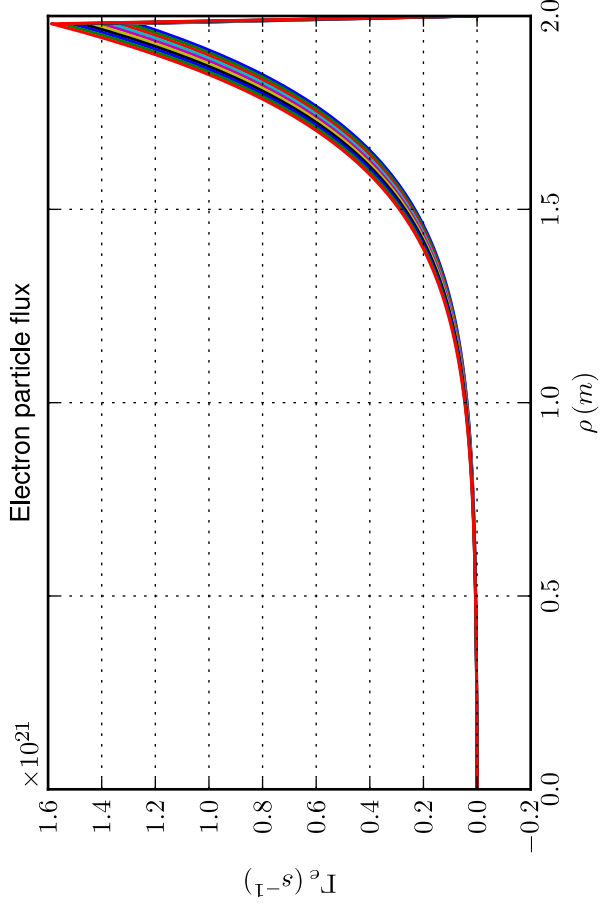
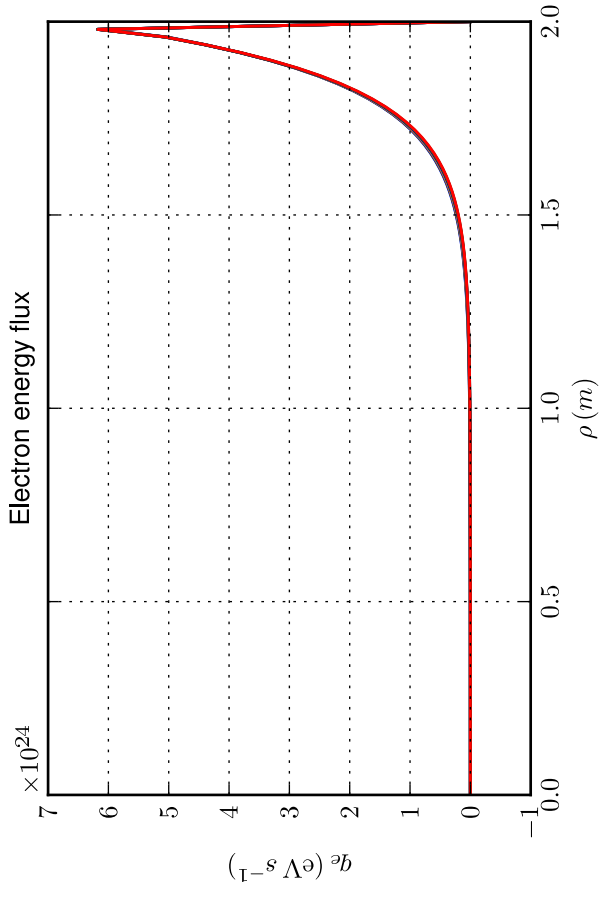
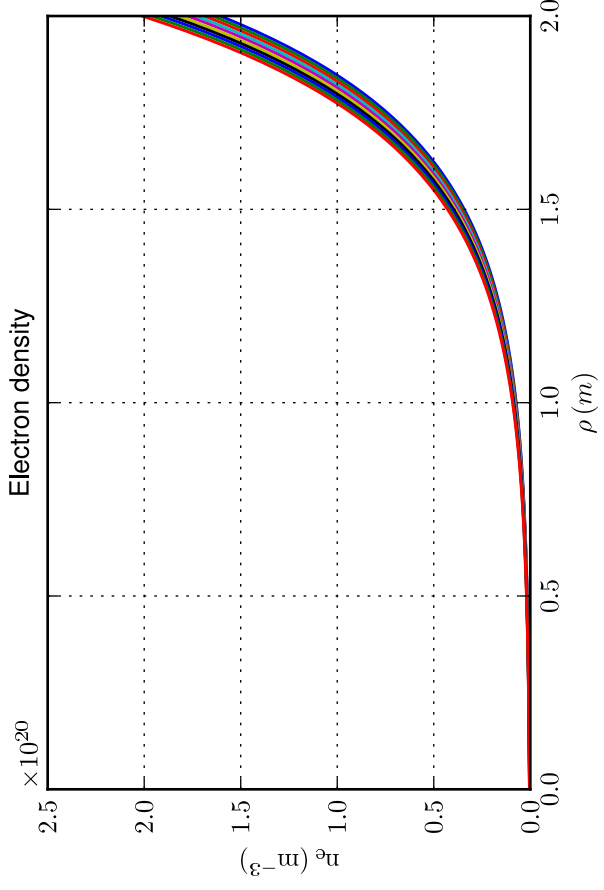
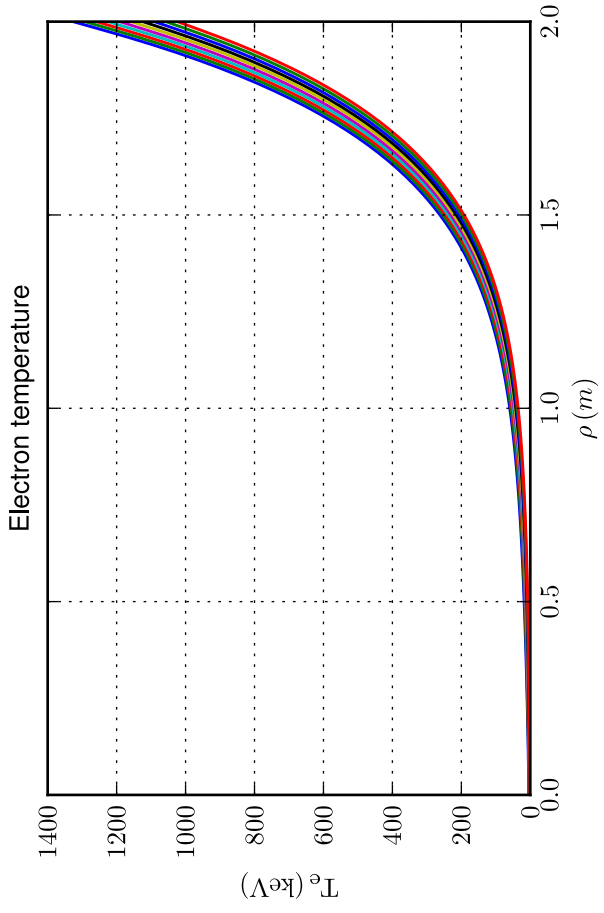
Profiles [Case: 1.1.5.b, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]  
 Spatial zoom over edge; time sampling: first 10 time slices or zoom over time  $0.1 \times (a^2/D)/|1 - (V_a/D)| = 0.80 \text{ s}$



- 0.00
- 0.10
- 0.20
- 0.30
- 0.40
- 0.50
- 0.60
- 0.70

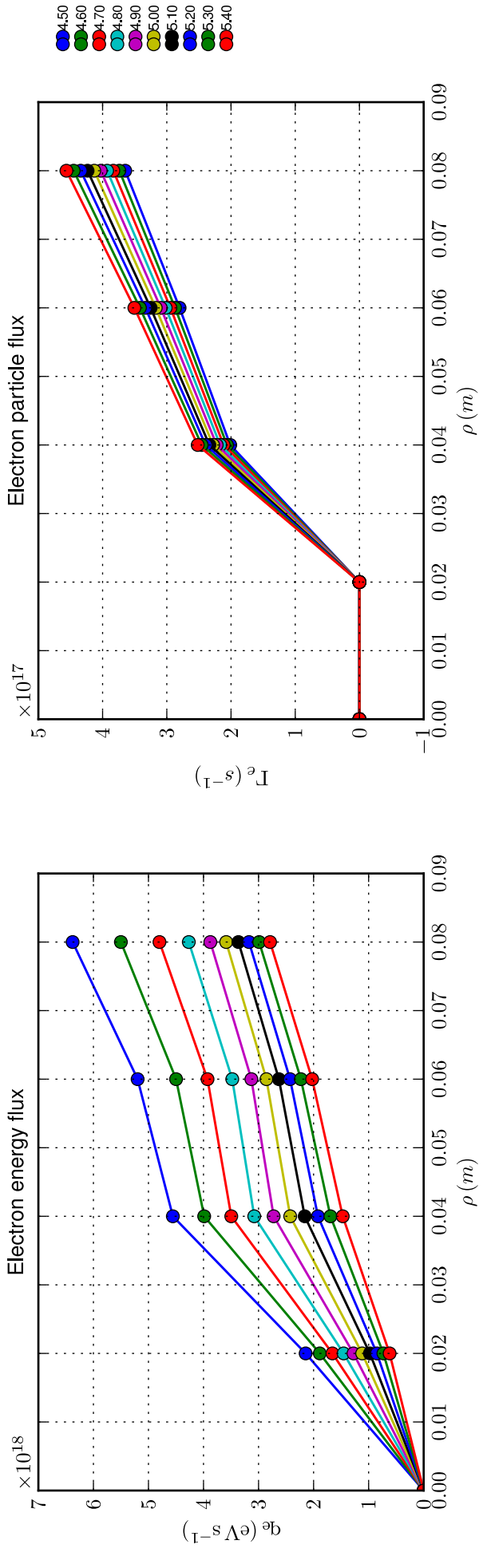
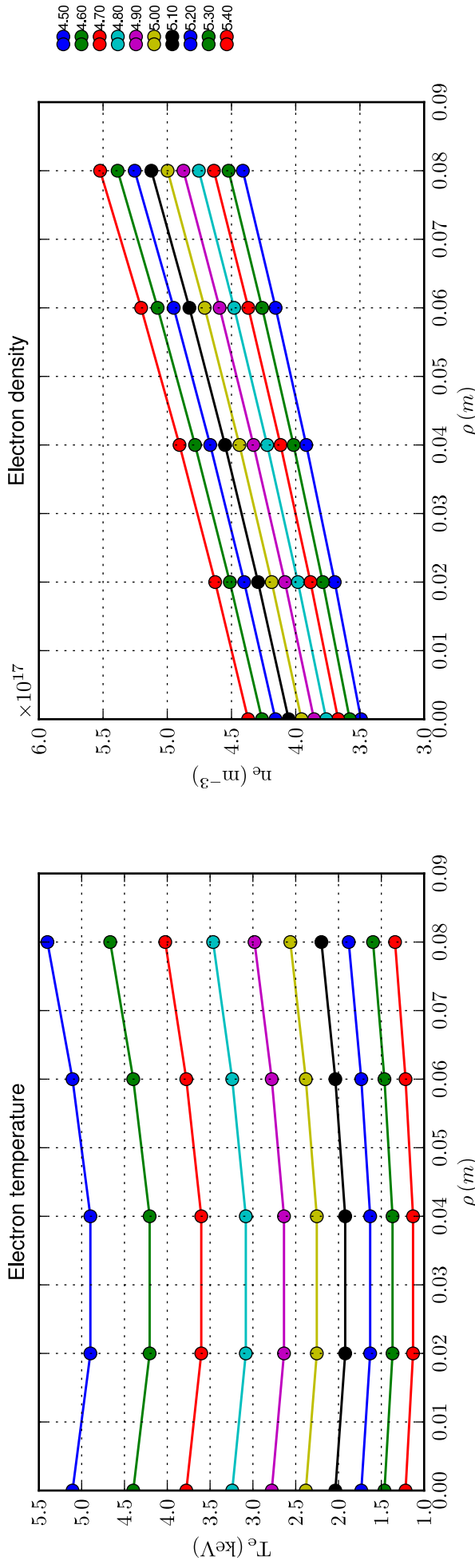
- 0.00
- 0.10
- 0.20
- 0.30
- 0.40
- 0.50
- 0.60
- 0.70

Profiles [Case: I.1.5.b, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_p = 101$ ]  
 Time sampling: last 10 time slices



Legend for time slices:  
 4.50 (blue)  
 4.60 (green)  
 4.70 (red)  
 4.80 (cyan)  
 4.90 (magenta)  
 5.00 (yellow)  
 5.10 (black)  
 5.20 (dark blue)  
 5.30 (dark green)  
 5.40 (dark red)

Profiles [Case: 1.1.5.b, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]  
 Spatial zoom over magnetic axis; time sampling: last 10 time slices



Profiles [Case: 1.1.5.b, Solver: 7,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.00$ ,  $\tau = 1.0 \times 10^{-3} \text{ s}$ ,  $N_\rho = 101$ ]  
 Spatial zoom over edge; time sampling: last 10 time slices

