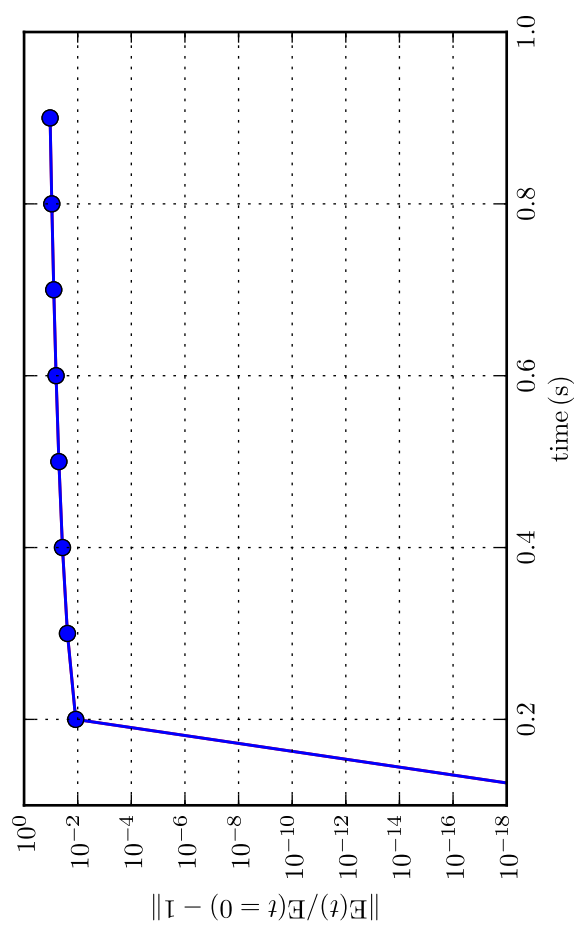
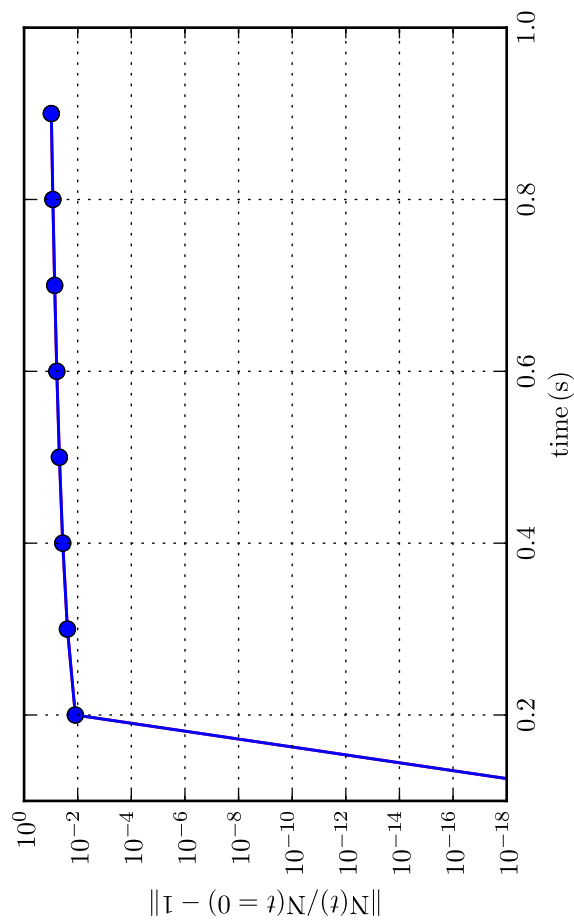
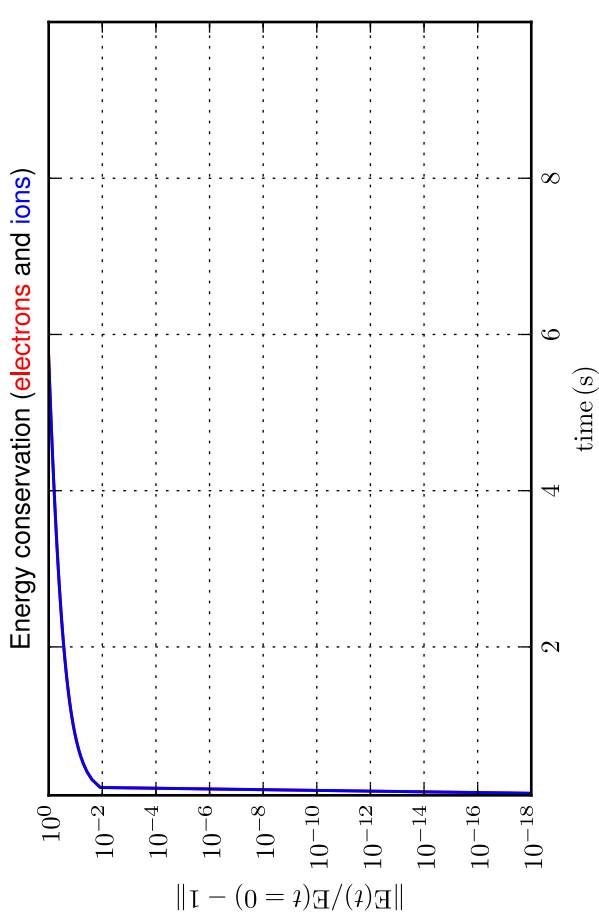
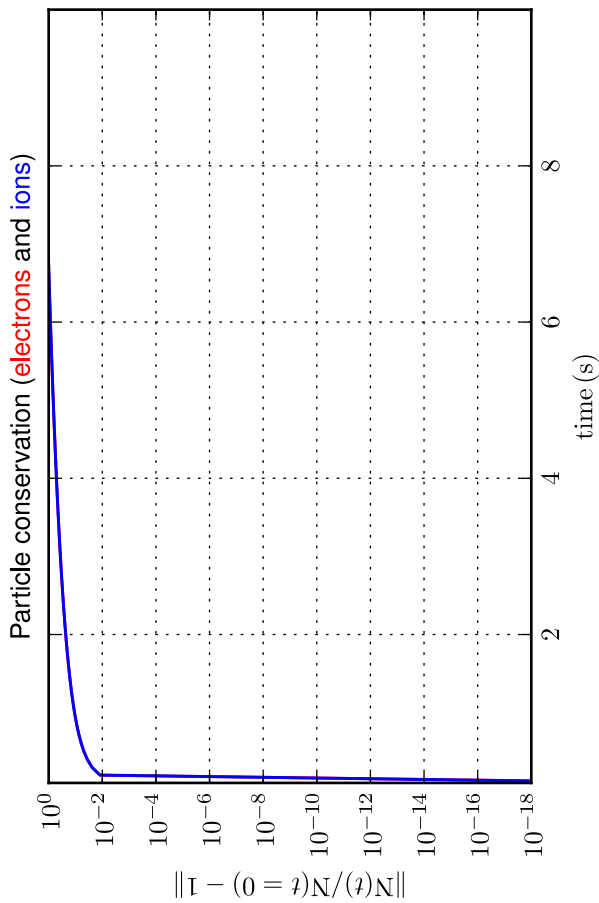
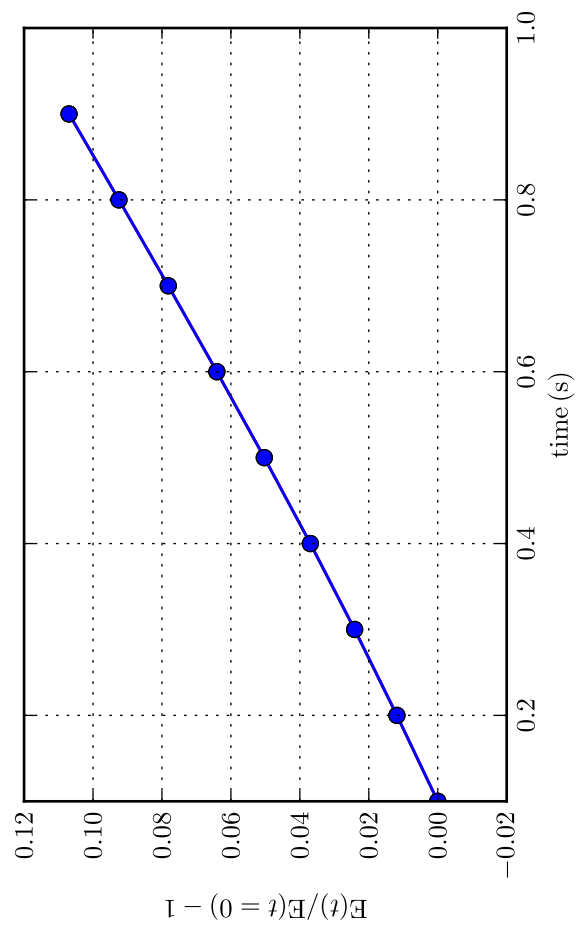
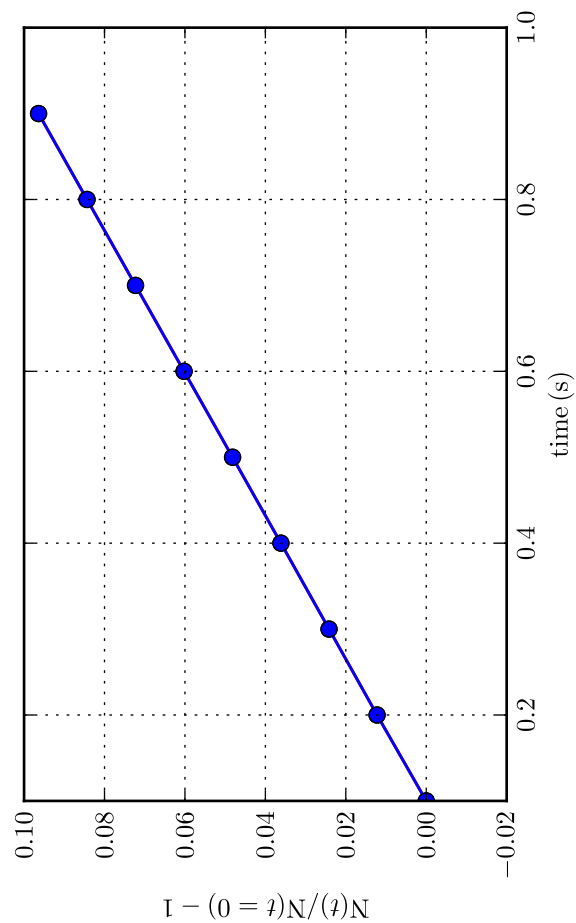
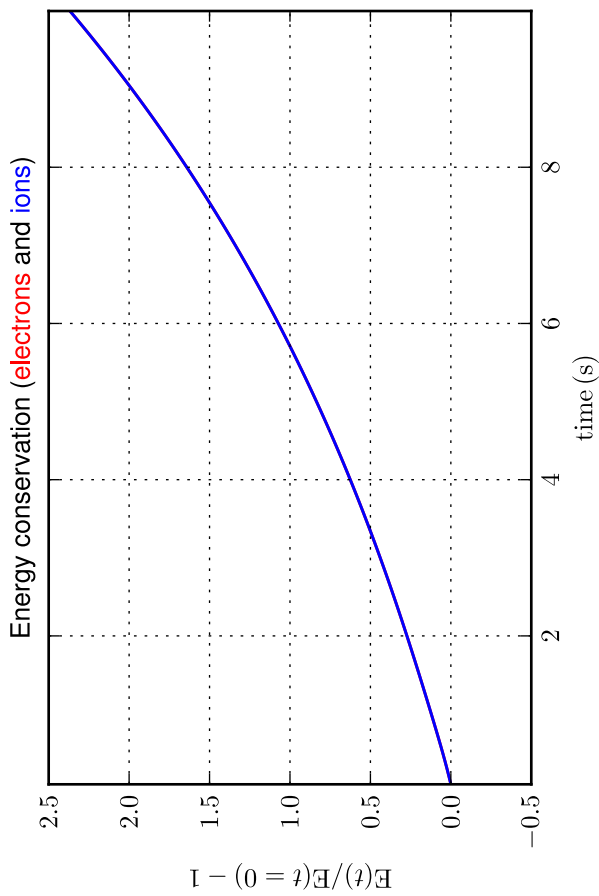
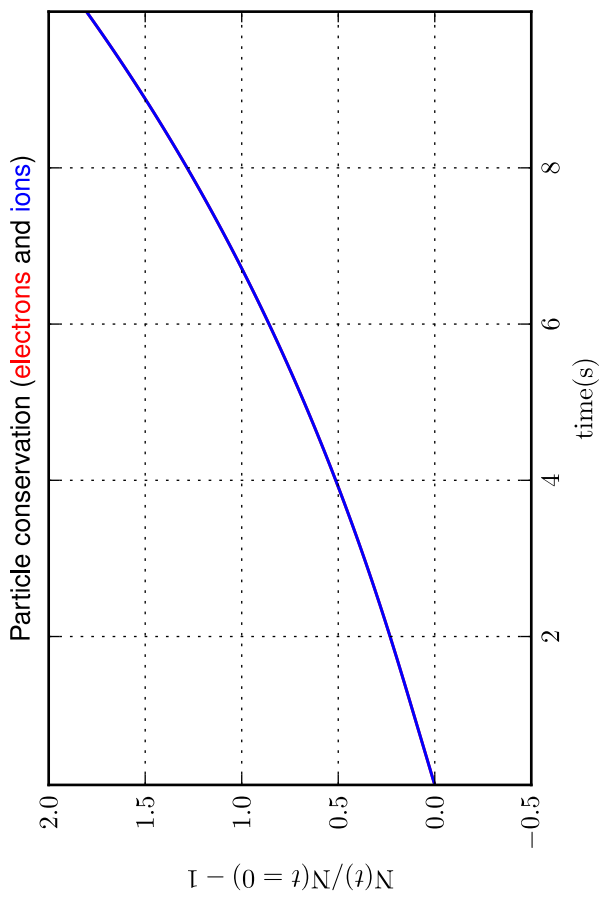


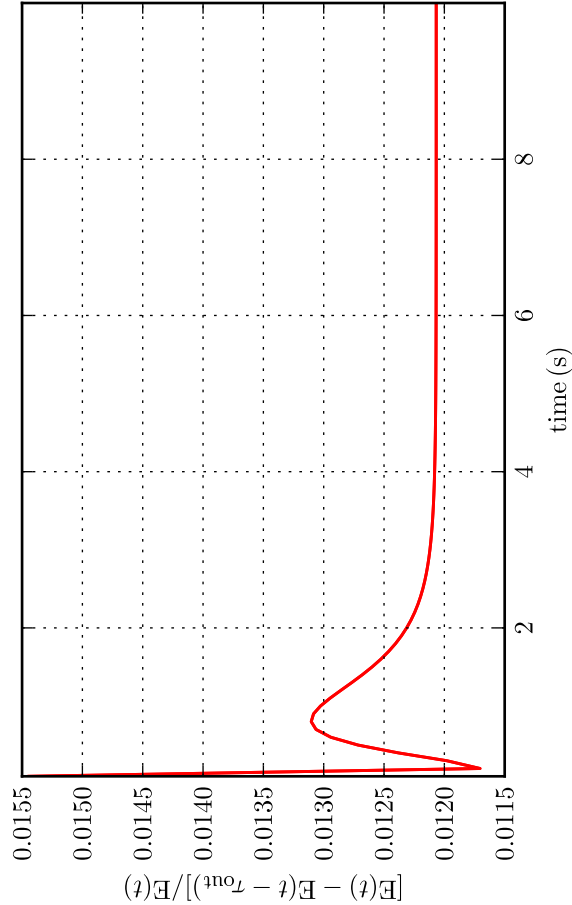
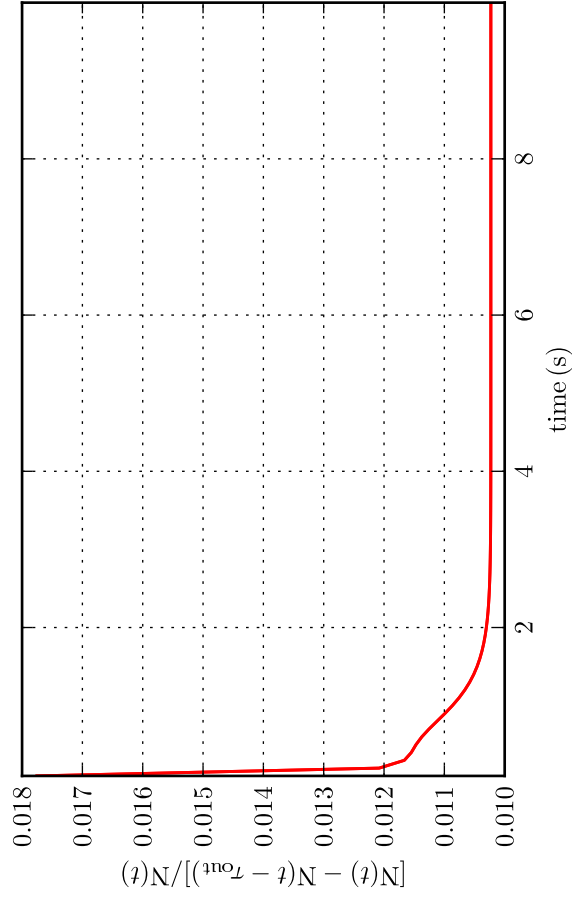
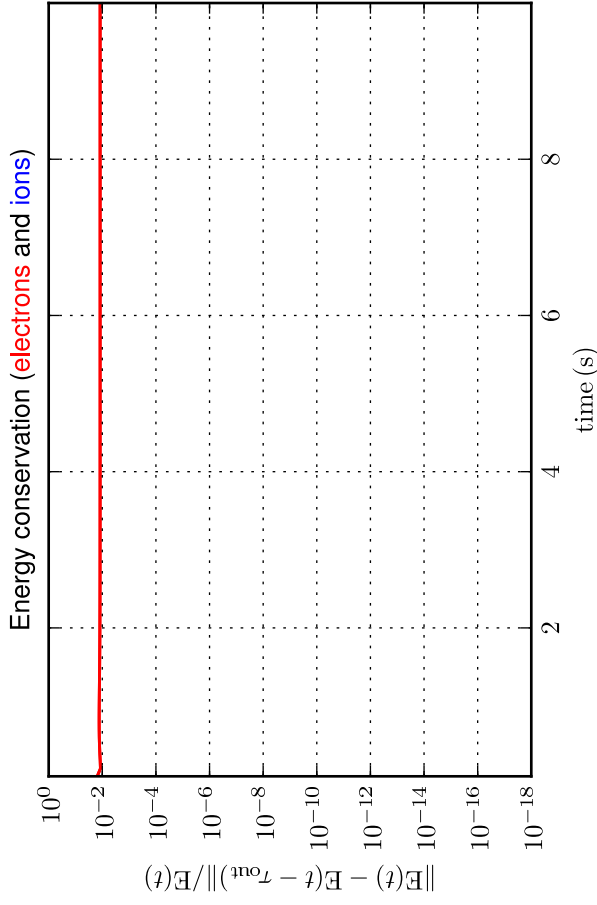
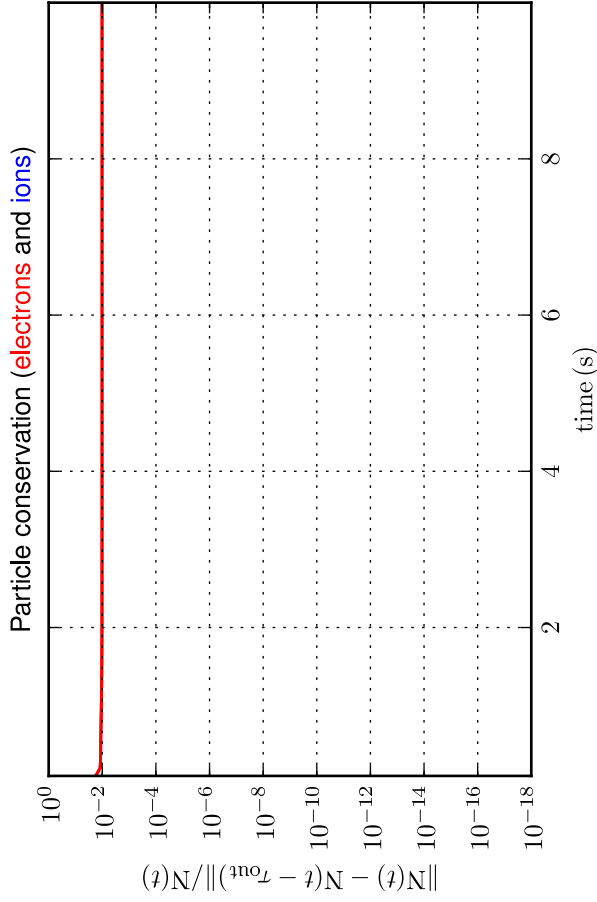
Part. & Energy conservation [Case: 1.1.5.b, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_p = 101$ ]  
 Comparison with initial solution - log scale; total time and zoom over time



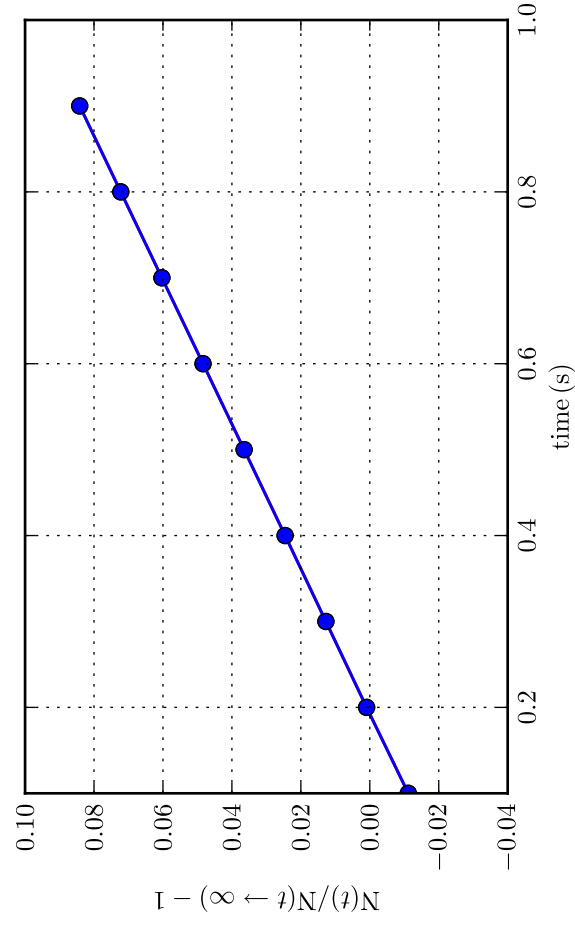
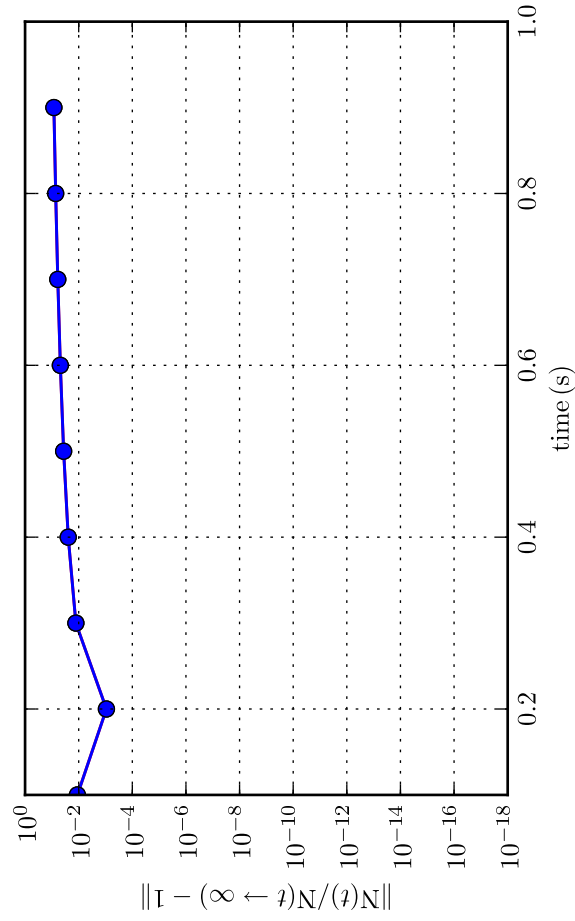
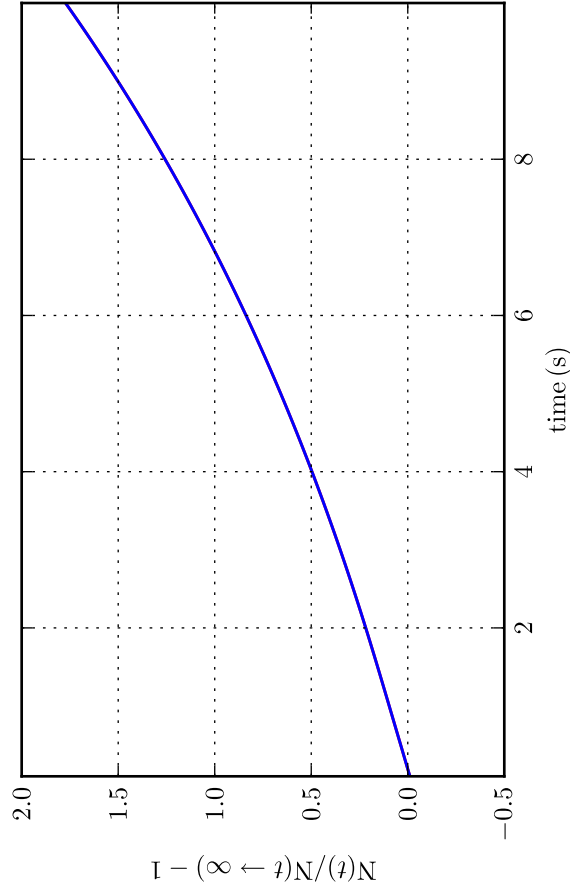
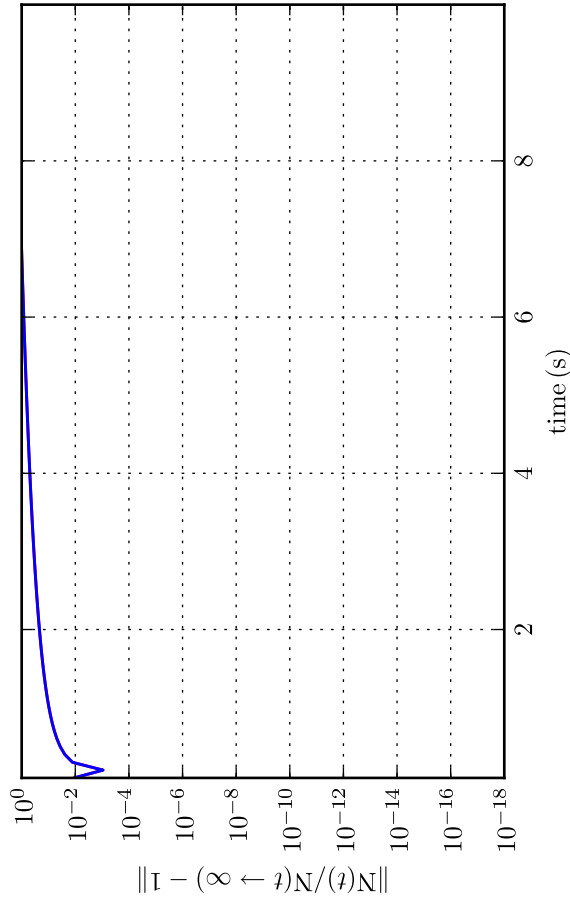
Part. & Energy conservation [Case: 1.1.5.b, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_p = 101$ ]  
 Comparison with initial solution - linear scale; total time and zoom over time



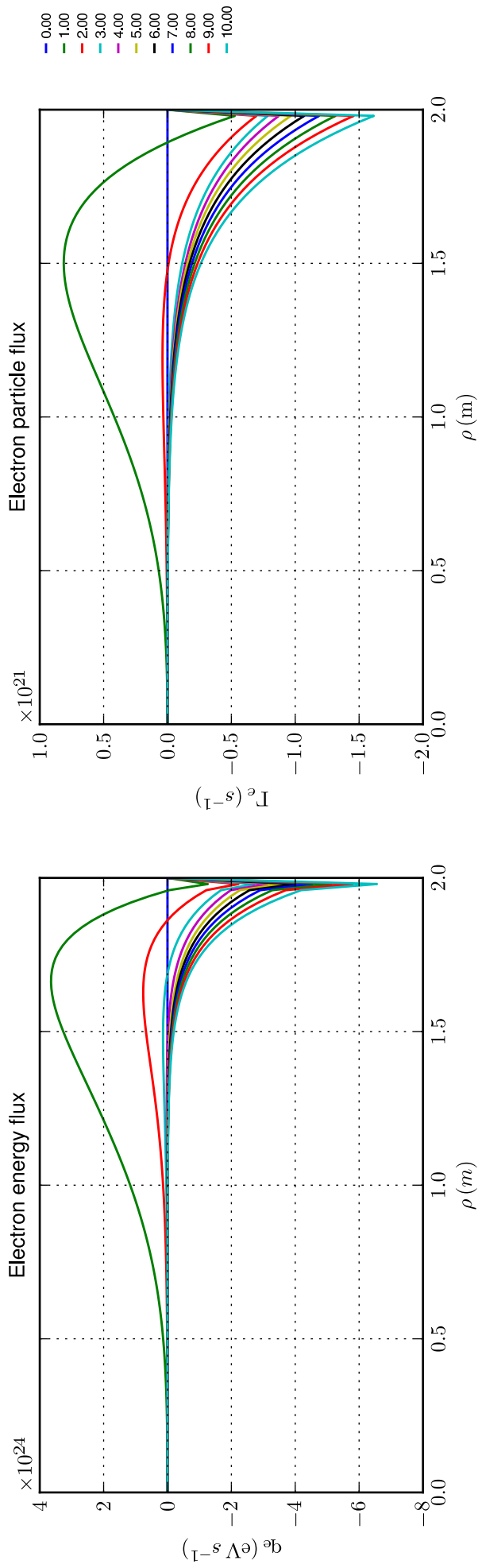
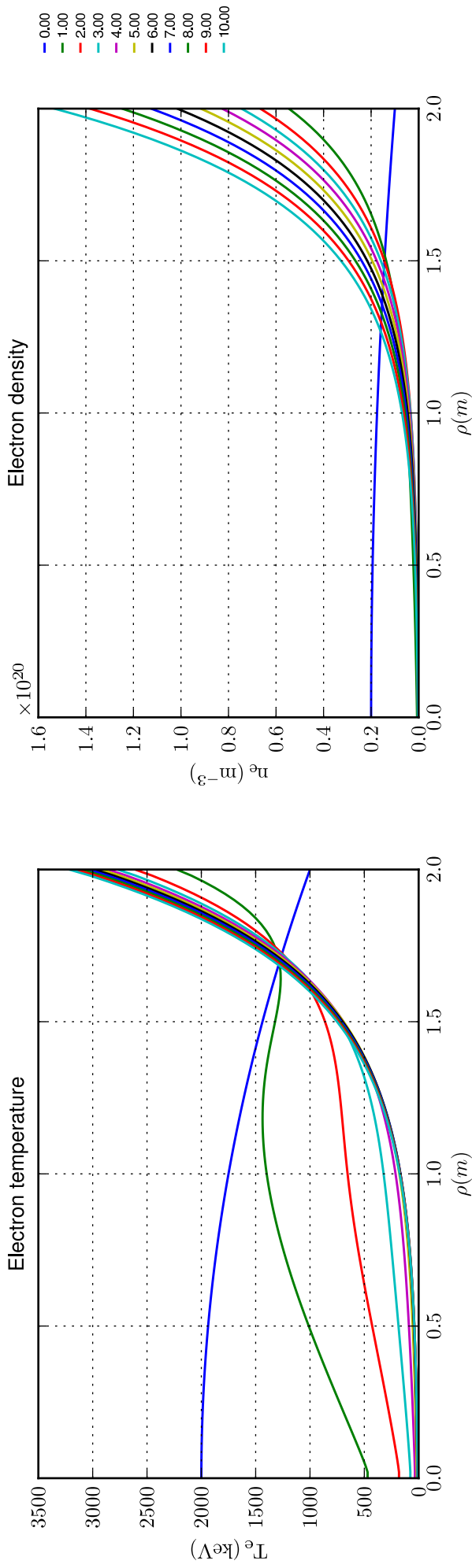
Part. & Energy conservation [Case: I.1.5.b, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_p = 101$ ]  
 Comparison with previous time-sampled ( $\tau_{\text{out}}$ ) solution - log and linear scales



Particle conservation [Case: 1.1.5.b, 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

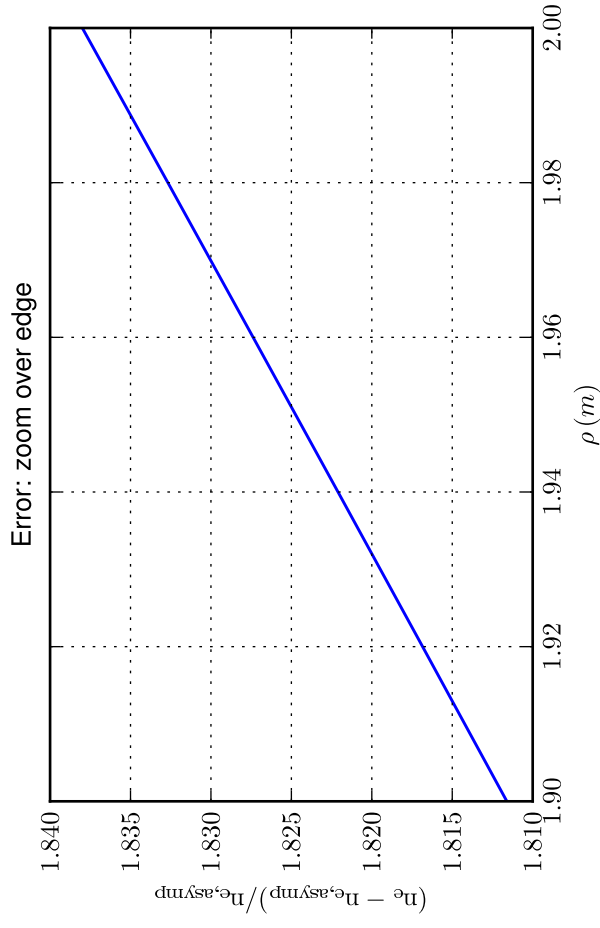
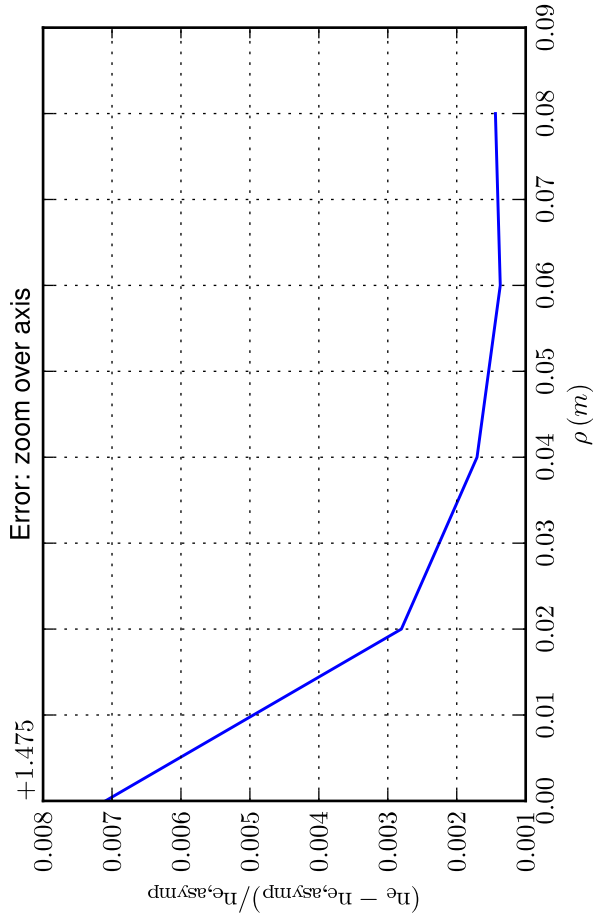
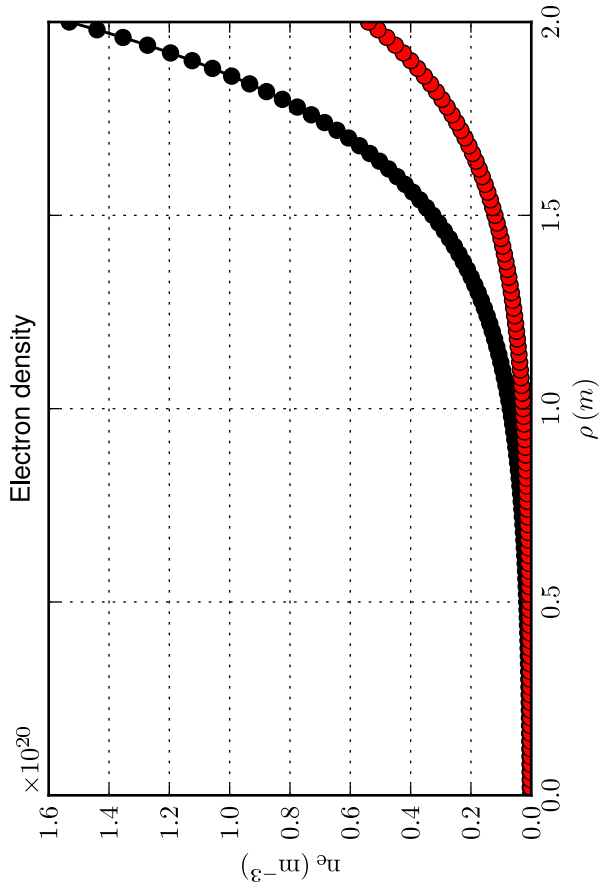
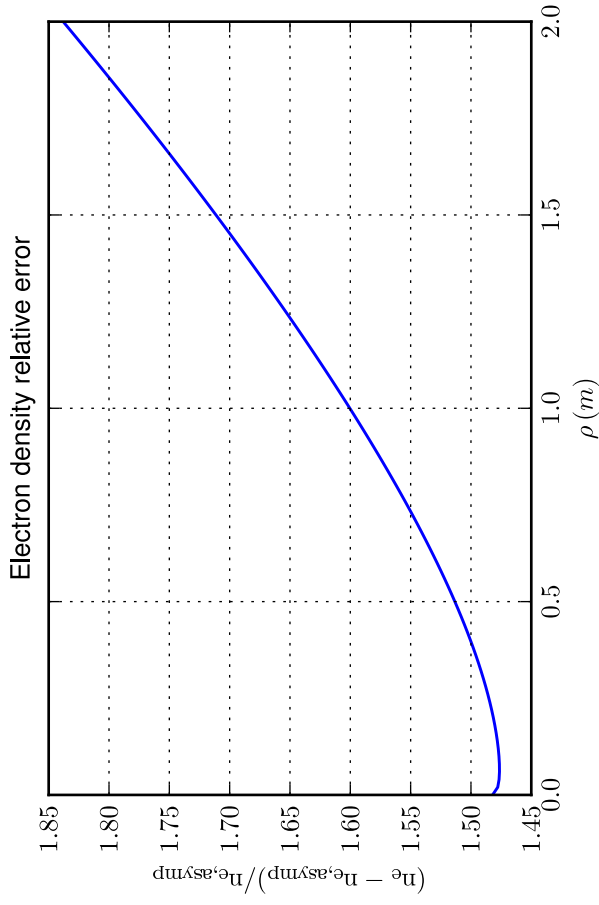


Profiles [Case: 1.1.5.b, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_p = 101$ ]  
 Time sampling: total simulation time/10



Profiles [Case: 1.1.5.b, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_\rho = 101$ ]

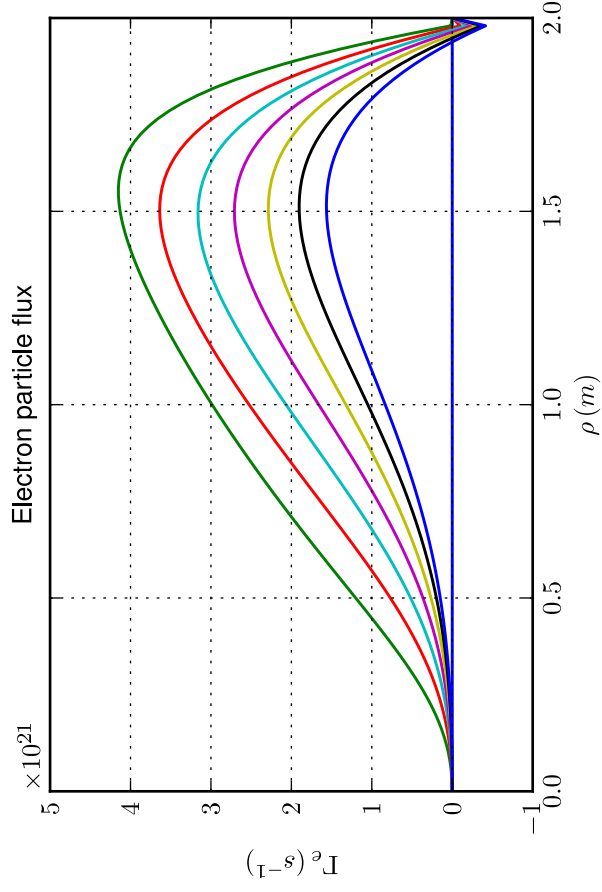
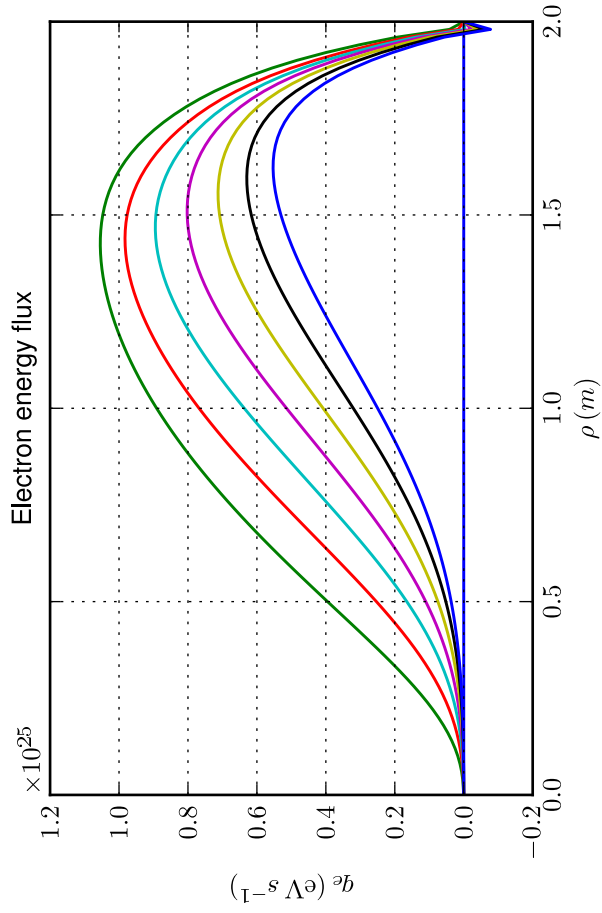
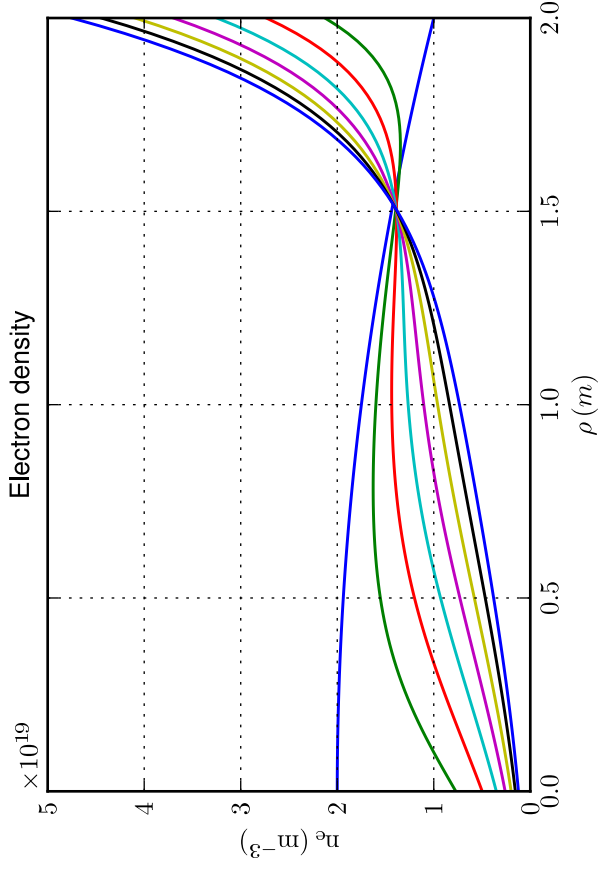
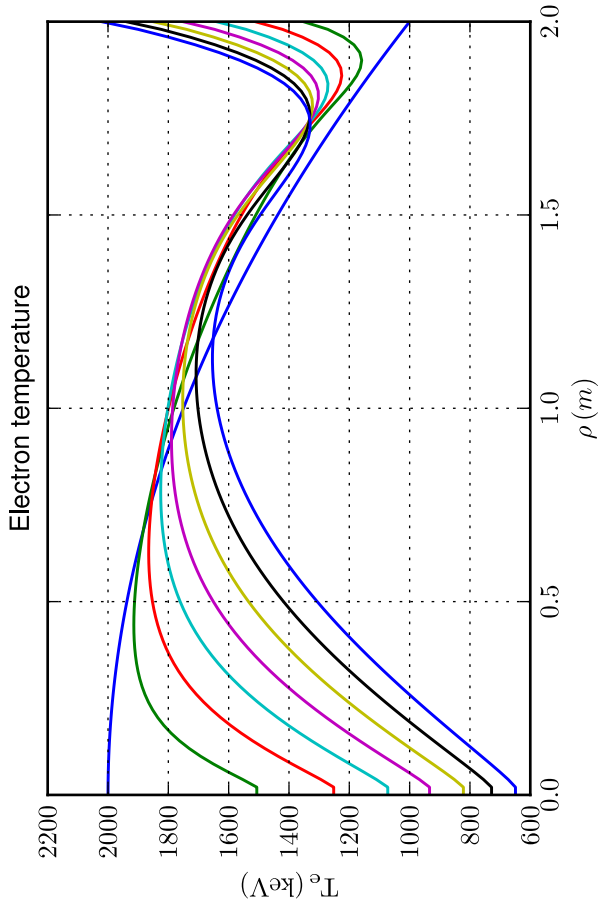
Comparison with asymptotic solution



● final calculation  
● asymptotic

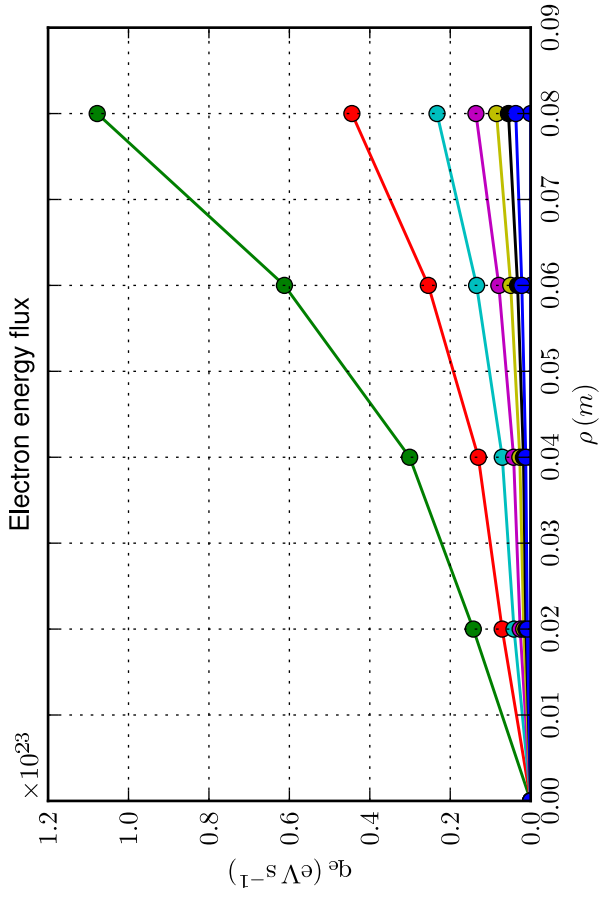
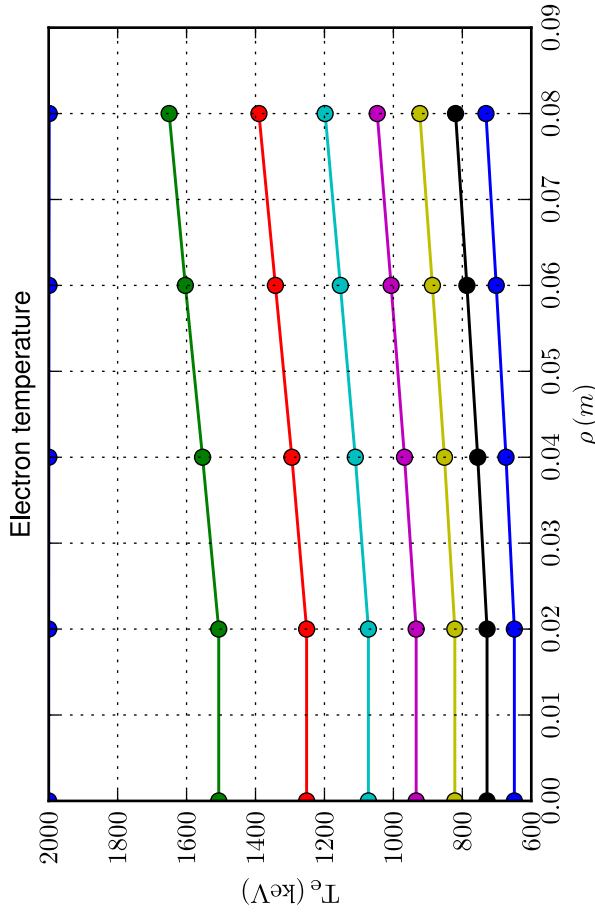
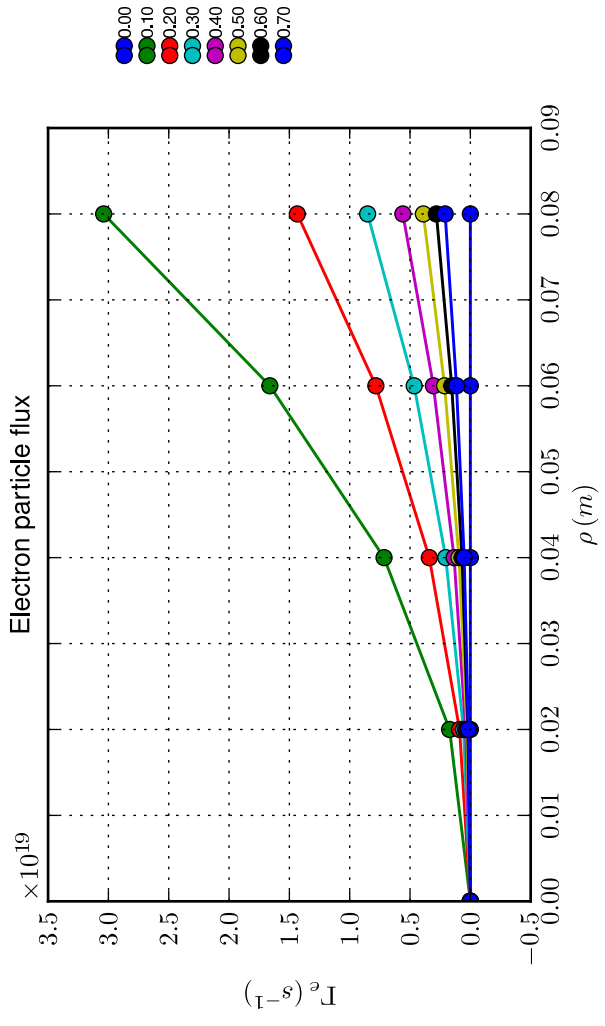
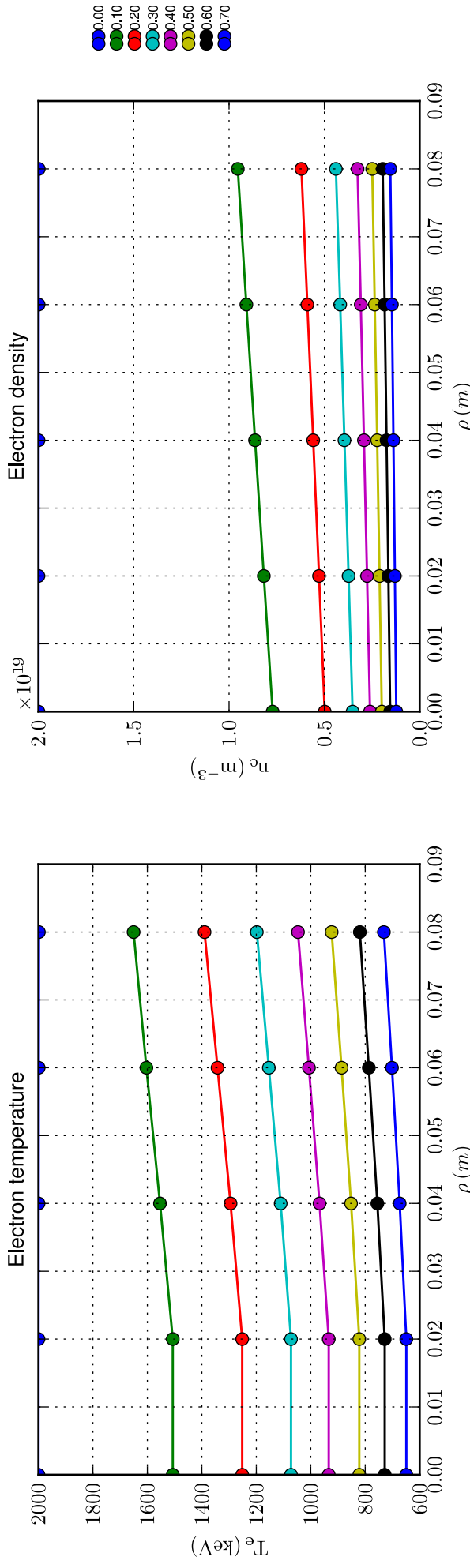
Profiles [Case: 1.1.5.b, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_\rho = 101$ ]

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



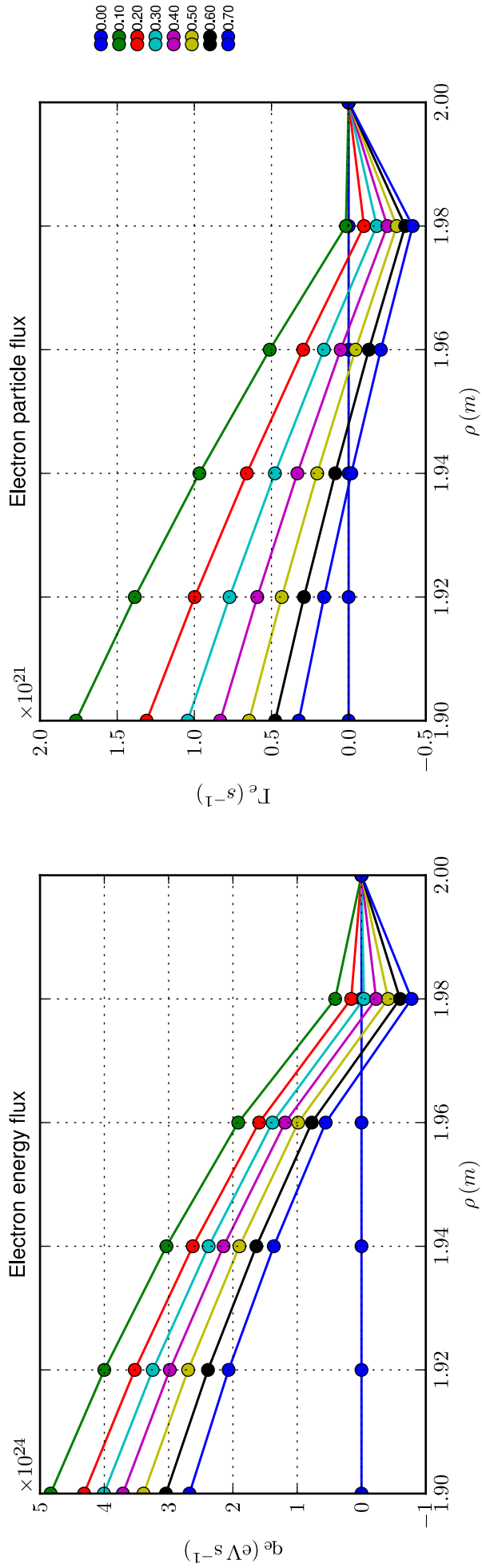
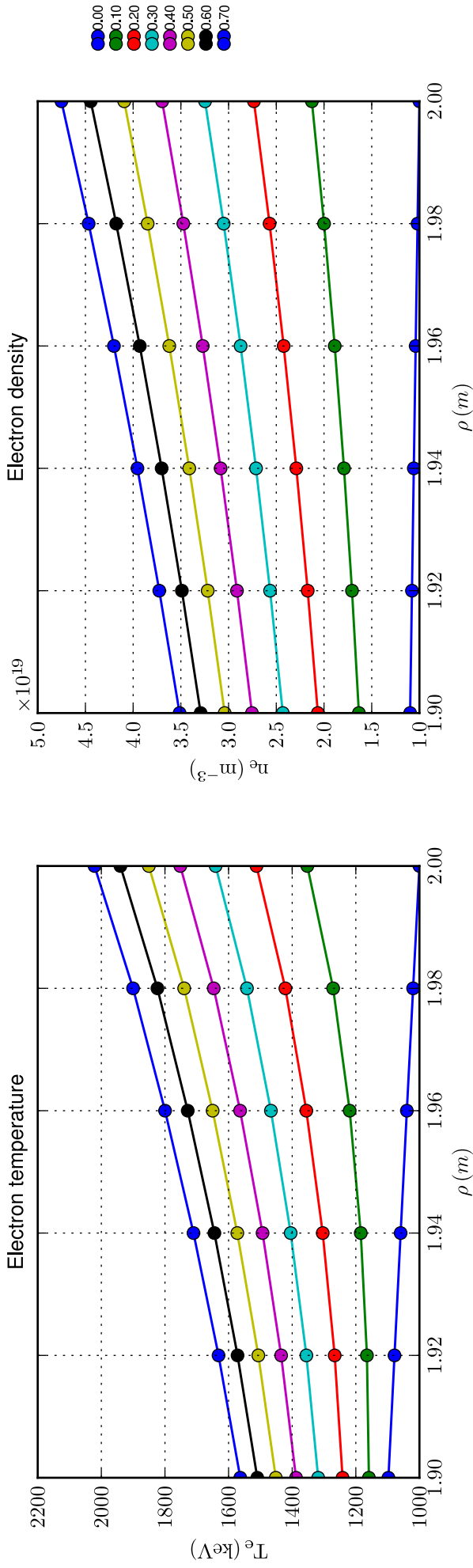
0.00  
0.10  
0.20  
0.30  
0.40  
0.50  
0.60  
0.70

Profiles [Case: I.1.5.b, Solver: 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  $0.1 \times (a^2/D)/|1 - (V a/D)| = 0.80 \text{ s}$

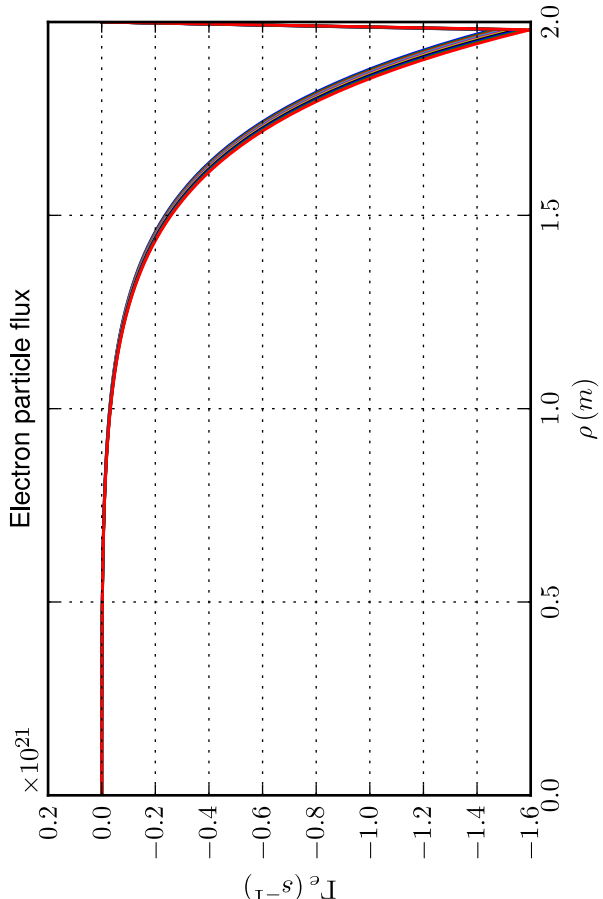
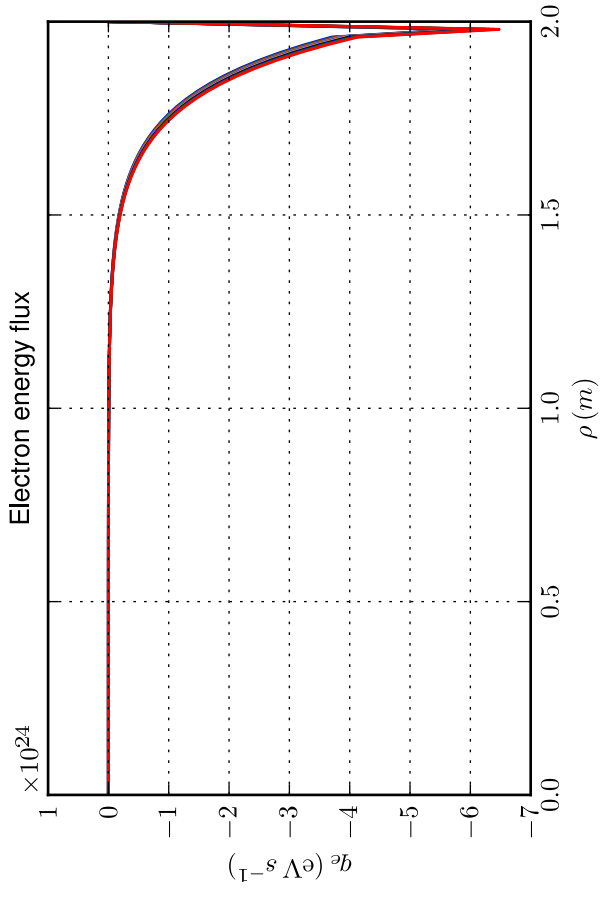
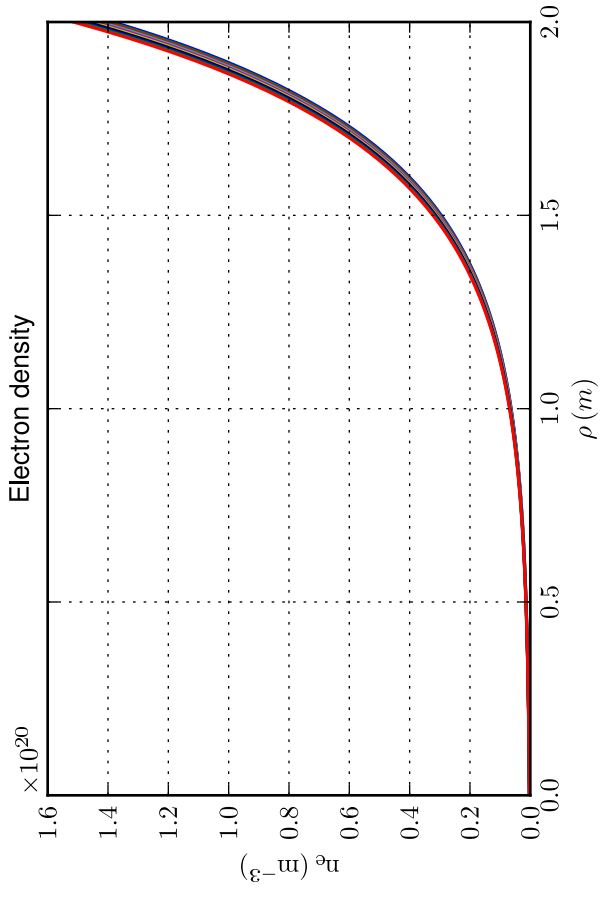
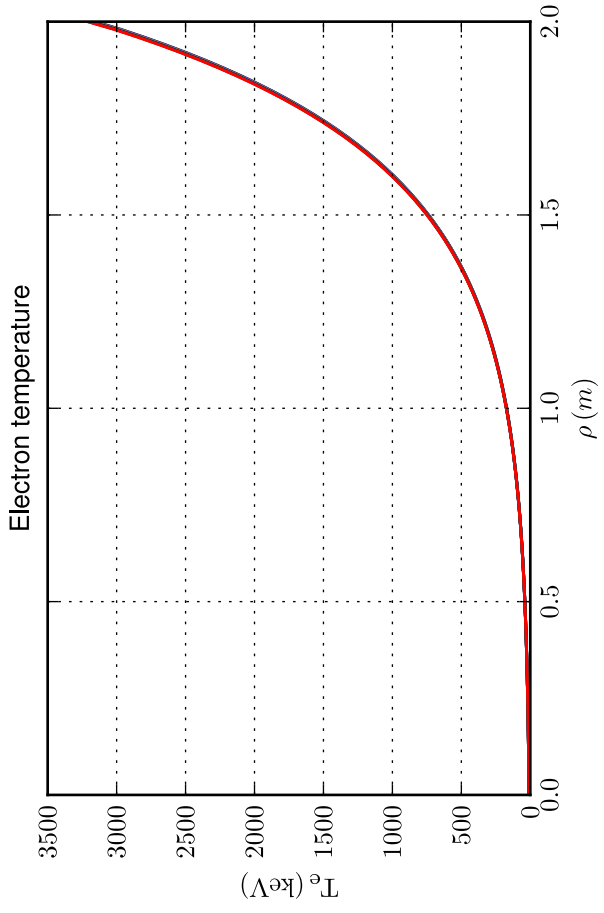




Profiles [Case: 1.1.5.b, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_\rho = 101$ ]  
 Spatial zoom over edge; time sampling: first 10 time slices or zoom over time  $0.1 \times (a^2/D)/|1 - (Va/D)| = 0.80 \text{ s}$

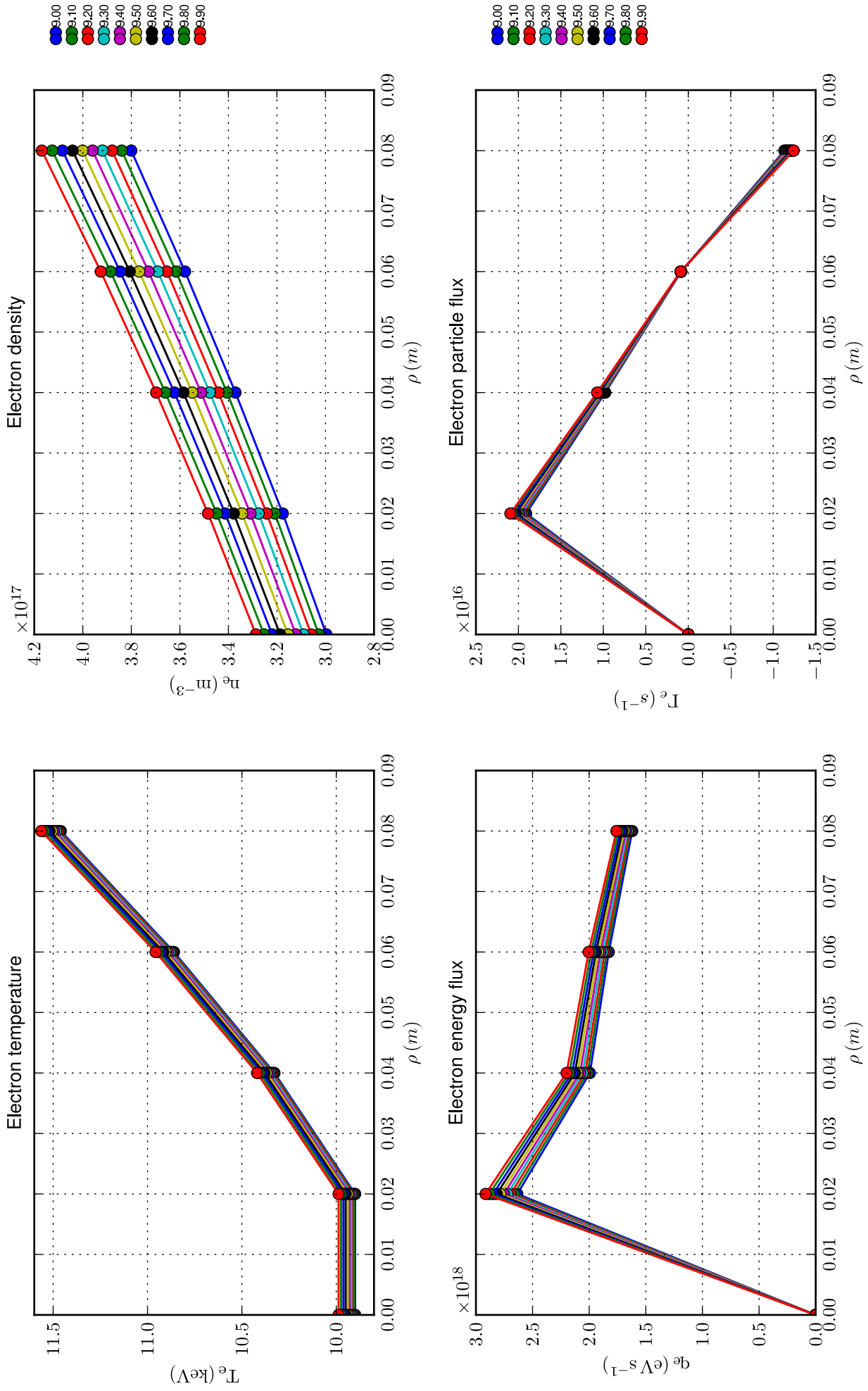


Profiles [Case: 1.1.5.b, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_p = 101$ ]  
 Time sampling: last 10 time slices



- 9.00
- 9.10
- 9.20
- 9.30
- 9.40
- 9.50
- 9.60
- 9.70
- 9.80
- 9.90

Profiles [Case: 1.1.5.b, Solver: 3,  $D = 0.1 \text{ m}^2/\text{s}$ ,  $v = 0.30 \text{ m/s}$ ,  $\Delta t = 10.01$ ,  $\tau = 1.0 \times 10^{-2} \text{ s}$ ,  $N_p = 101$ ]  
 Spatial zoom over magnetic axis; time sampling: last 10 time slices



Profiles [Case: 1.1.5.b, 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

