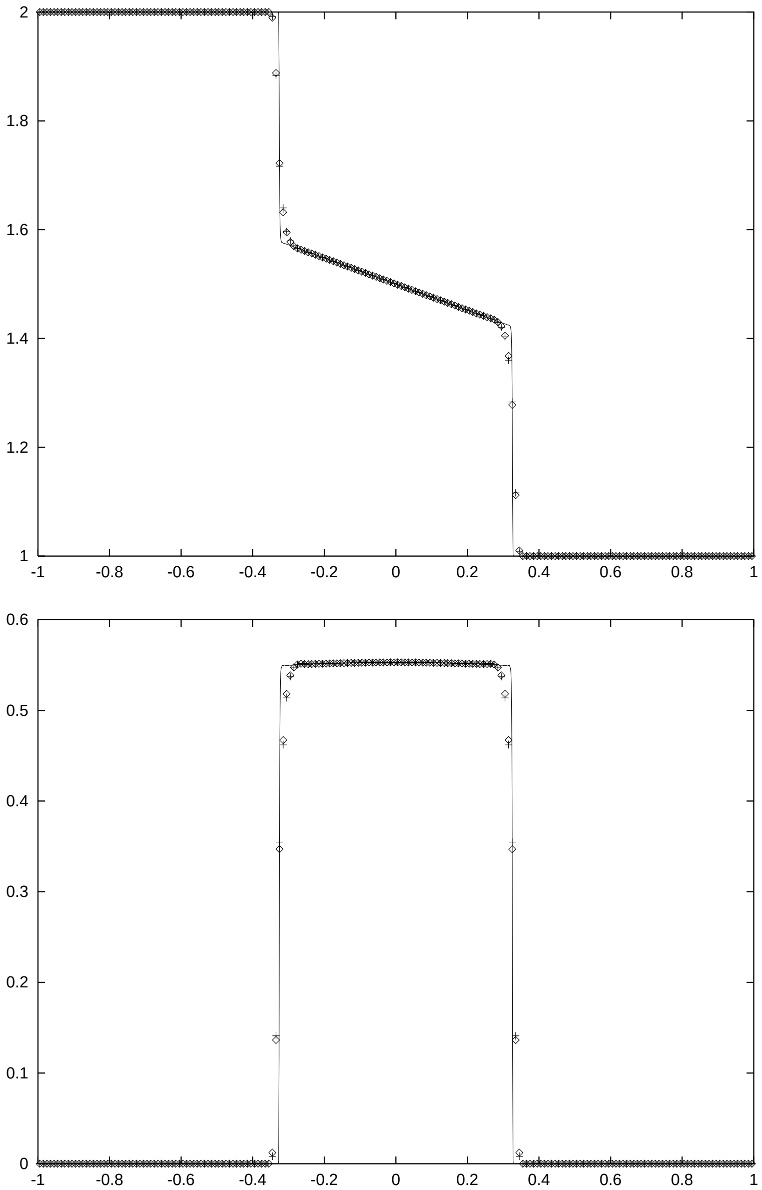


Figure 1a,b: Numerical solution at time $t = 0.25$ for problem (5.1) in the rarefied regime $\epsilon = 0.7$ with $\Delta t = 0.005$ and $\Delta x = 0.01$. The mass density ρ (top) and the flow j (bottom) are compared for both schemes, SIU ($\times$) and FIC ($\diamond$).

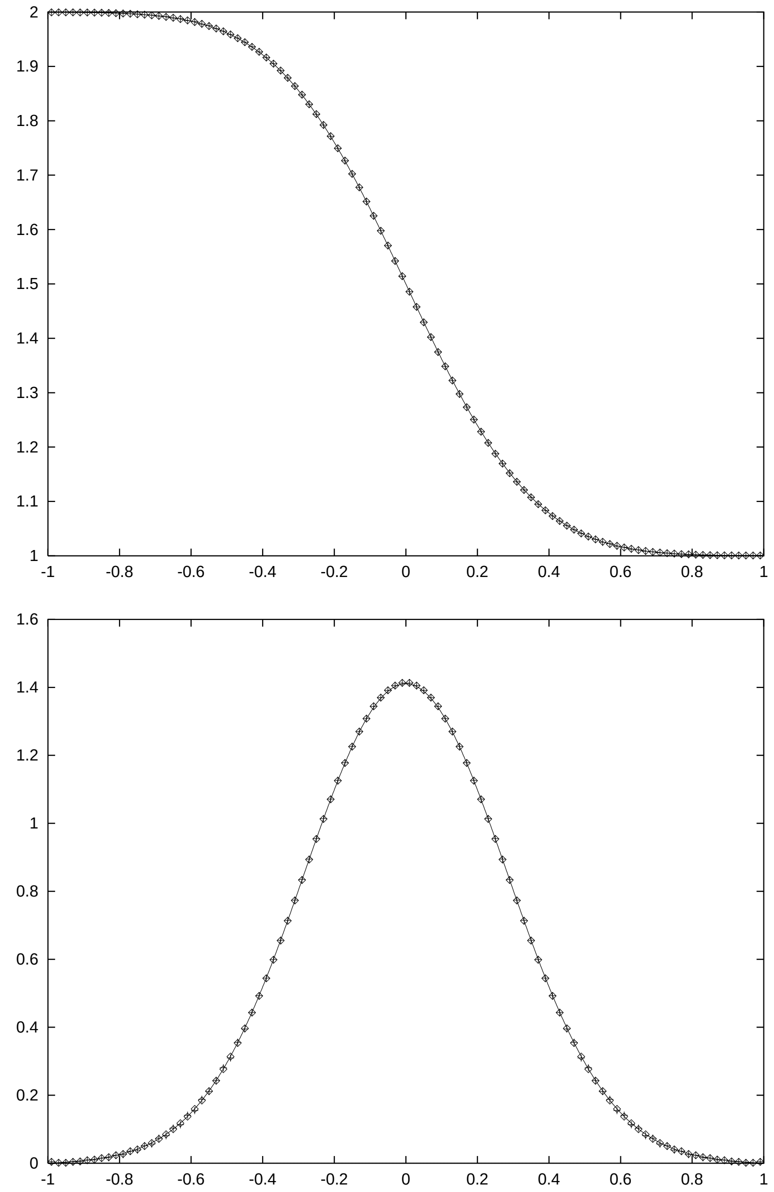


Figure 1c,d: Numerical solution at time $t = 0.04$ for problem (5.1) in the parabolic regime $\epsilon = 10^{-6}$ with $\Delta t = 0.005$ and $\Delta x = 0.02$. The mass density ρ (top) and the flow j (bottom) are compared for both schemes, SIU ($\times$) and FIC ($\diamond$).

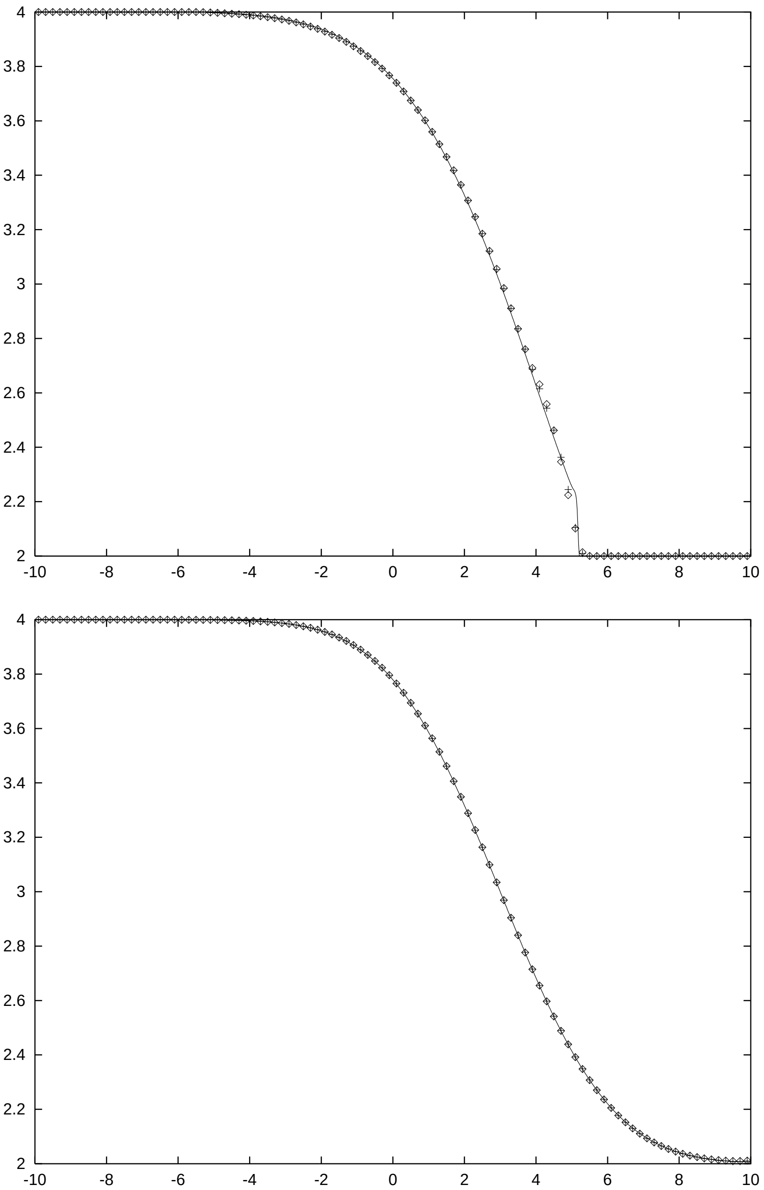


Figure 2a,b: Numerical solution at time $t = 3.0$ for problem (5.2) in the intermediate $\epsilon = 0.5$ (top) and parabolic regime $\epsilon = 10^{-6}$ (bottom) with $\Delta t = 0.02$ and $\Delta x = 0.2$. The mass density ρ is plotted for both schemes, SIU ($\times$) and FIC ($\diamond$).

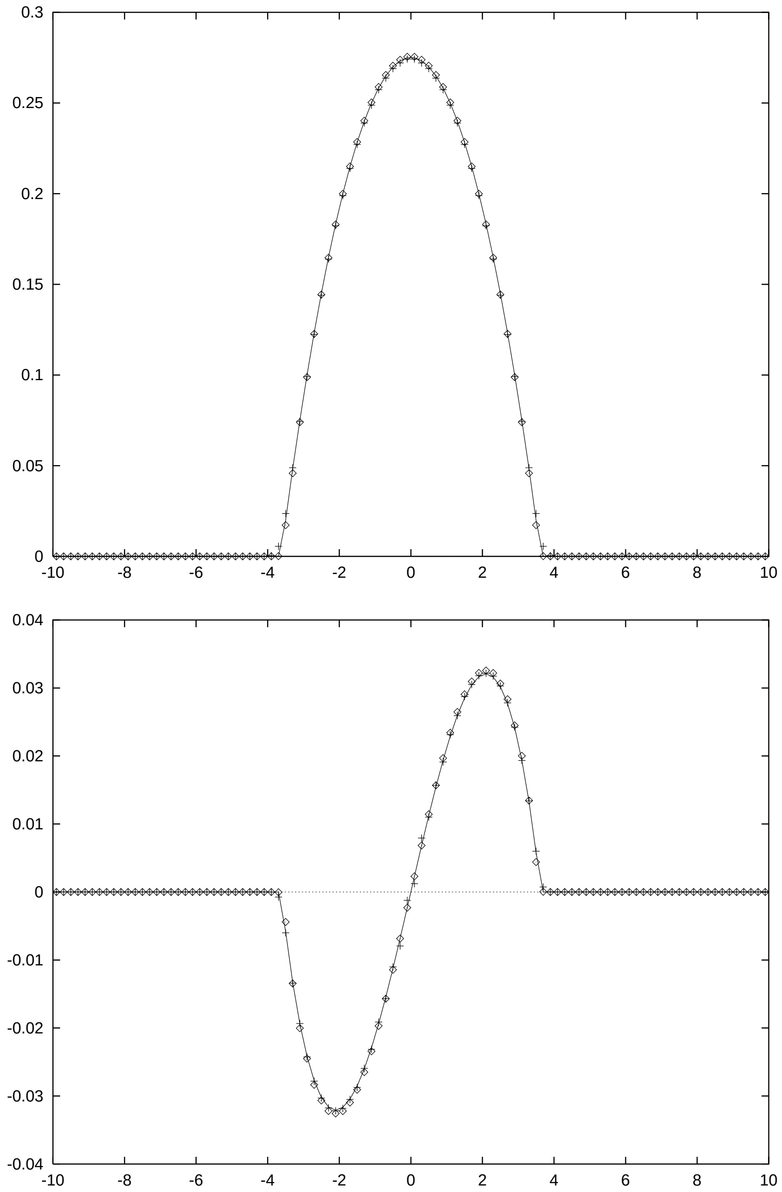


Figure 3a,b: Numerical solution at time $t = 3.0$ for the Barenblatt problem (5.3) in the parabolic regime $\epsilon = 10^{-6}$ with $\Delta t = 0.02$ and $\Delta x = 0.2$. The mass density ρ (top) and the flow j (bottom) are compared for both schemes, SIU ($\times$) and FIC ($\diamond$).

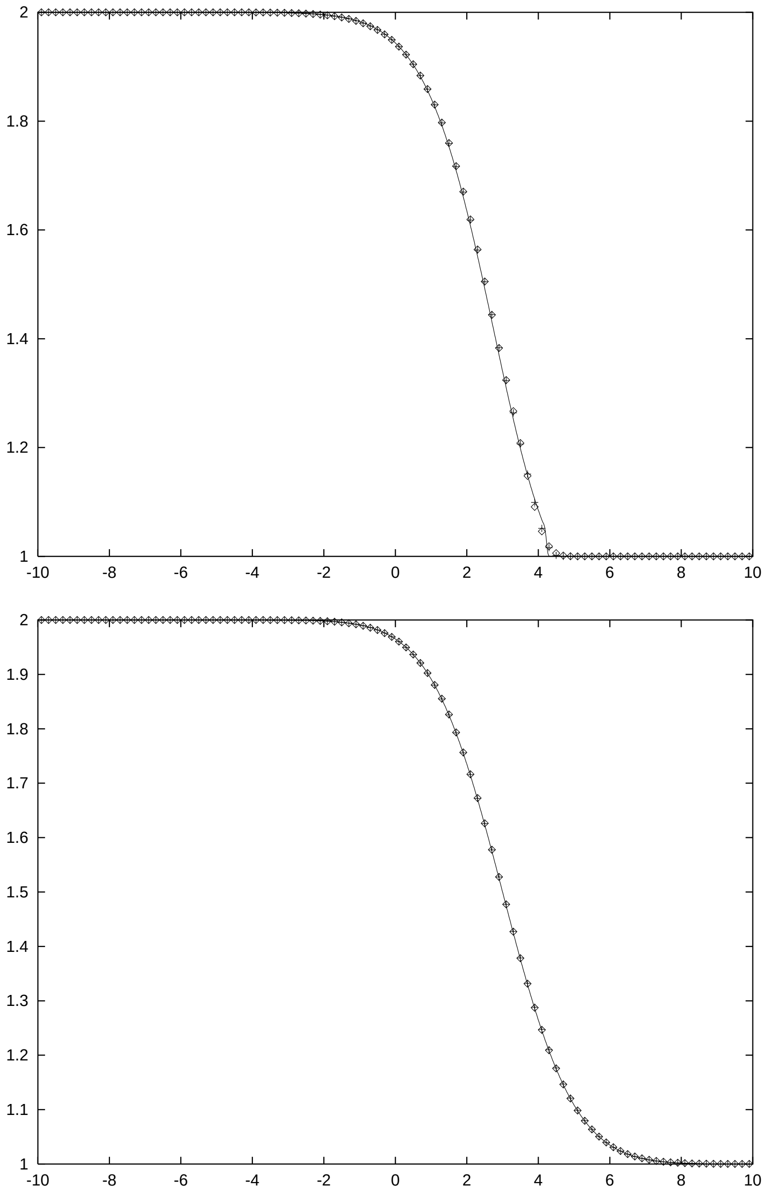
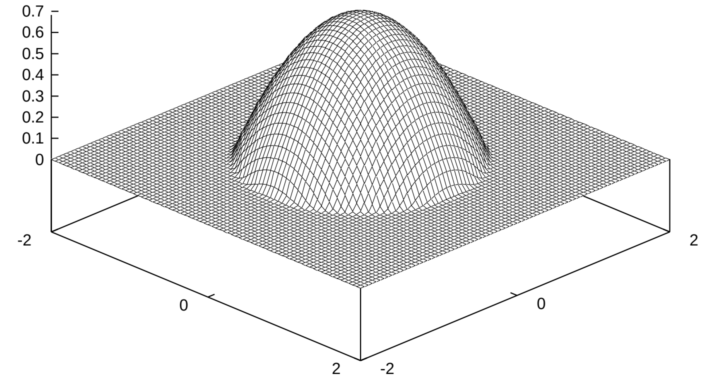


Figure 4a,b: Numerical solution at time $t = 2.0$ for the initial data (5.4) in the intermediate $\epsilon = 0.4$(top) and parabolic regime $\epsilon = 10^{-6}$(bottom) with $\Delta t = 0.01$ and $\Delta x = 0.2$. The mass density is plotted for both schemes, SIU ($\times$) and FIC ($\diamond$).



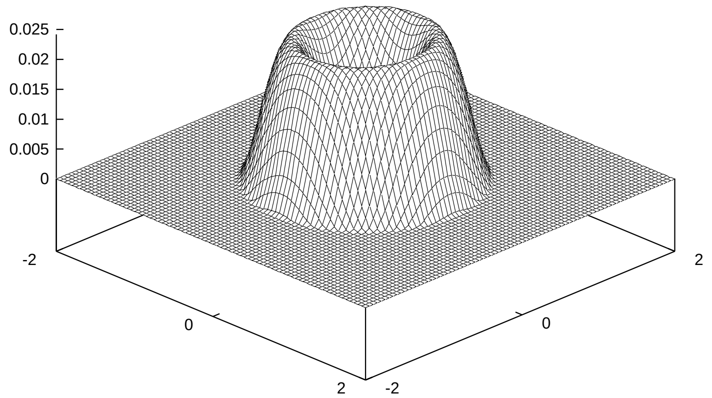
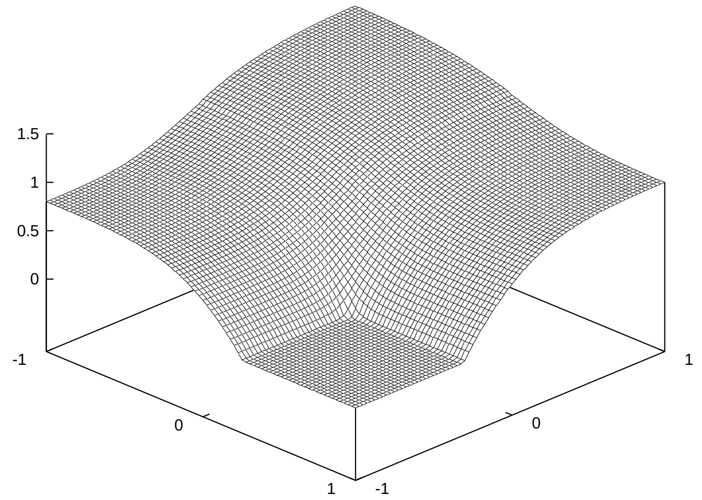


Figure 5a,b: Numerical solution of the 2D porous media equation at time $t = 0.25$ for initial data (5.5) with $\Delta t = 0.002$ and $\Delta x = 0.05$. The mass density ρ (top) and the flow j (bottom) are plotted for the FIC scheme.



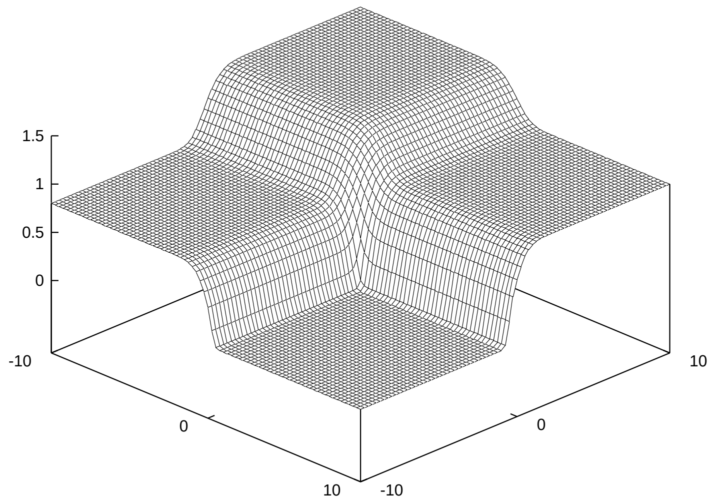


Figure 6a,b: Numerical solution of the FIC scheme for the mass density at time $t = 0.12$ for the 'oblique' problem (5.6) in the rarefied regime $\epsilon = 0.1$ with $\Delta t = 0.002$ and $\Delta x = 0.025$ (top). Same solution in the diffusive regime $\epsilon = 10^{-6}$ at time $t = 0.5$ with with $\Delta t = 0.05$ and $\Delta x = 0.25$ (bottom).