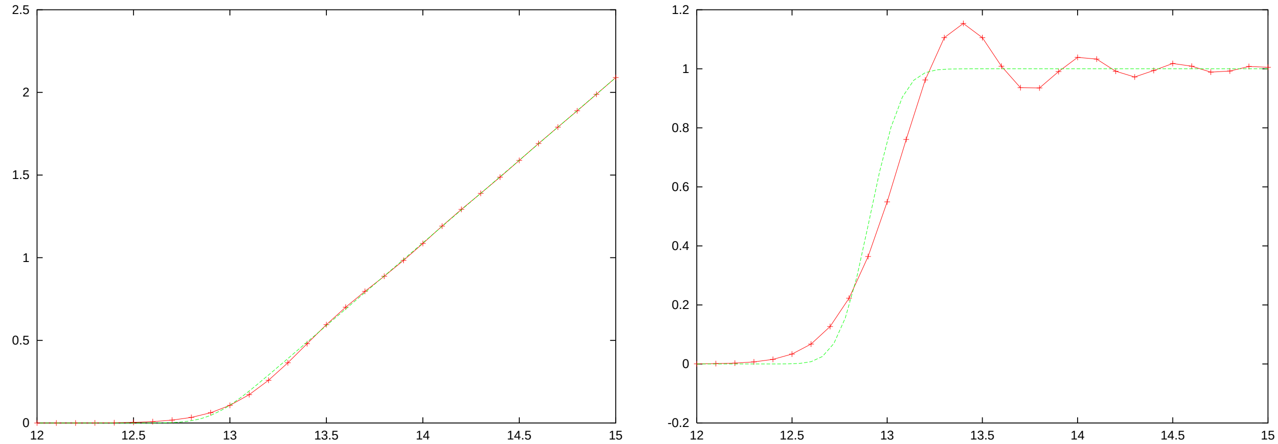
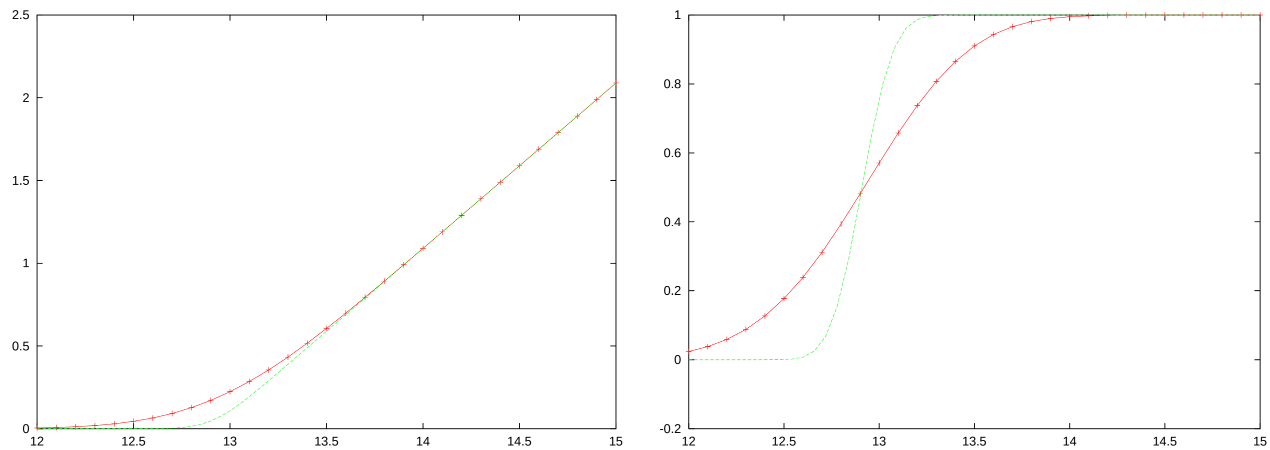
FTCS: links $V(S,0)$, rechts $\Delta(S,0)$ (gestrichelt: exakte Lösung)



FTBS / upwind: links $V(S,0)$, rechts $\Delta(S,0)$ (gestrichelt: exakte Lösung)



Lax-Wendroff für $u_t + (f(u))_x = 0$

$$w_{j+\frac{1}{2},\nu+\frac{1}{2}} := \tfrac{1}{2}(w_{j\nu} + w_{j+1,\nu}) - \tfrac{\Delta t}{2\Delta x}\left(f(w_{j+1,\nu}) - f(w_{j\nu})\right)$$
$$w_{j-\frac{1}{2},\nu+\frac{1}{2}} := \tfrac{1}{2}(w_{j-1,\nu} + w_{j\nu}) - \tfrac{\Delta t}{2\Delta x}\left(f(w_{j\nu}) - f(w_{j-1,\nu})\right)$$
$$w_{j,\nu+1} := w_{j\nu} - \tfrac{\Delta t}{\Delta x}\left(f(w_{j+\frac{1}{2},\nu+\frac{1}{2}}) - f(w_{j-\frac{1}{2},\nu+\frac{1}{2}})\right)$$

Für $u_t + au_x = 0$, für $a > 0$:
Mit $\delta_x^- w_{j\nu} := w_{j\nu} - w_{j-1,\nu}$ lautet das *upwind*-Schema

$$w_{j,\nu+1} = w_{j\nu} - \gamma\delta_x^- w_{j\nu} \;, \quad \gamma = \frac{a\Delta t}{\Delta x}$$

und Lax-Wendroff

$$w_{j,\nu+1} = w_{j\nu} - \gamma\delta_x^- w_{j\nu} - \delta_x^-\{\tfrac{1}{2}\gamma(1-\gamma)(w_{j+1,\nu} - w_{j\nu})\}$$