I changed the stopping criterium. The new stopping criterium is:

$$\frac{||l^{-1}r||_2}{||l^{-1}b||_2} \leq tol + \frac{tolNR}{||x_k||_2},$$

with tolNR the tolerance of the NR method, and tol the tolerance of the linear solver.

Incompressible

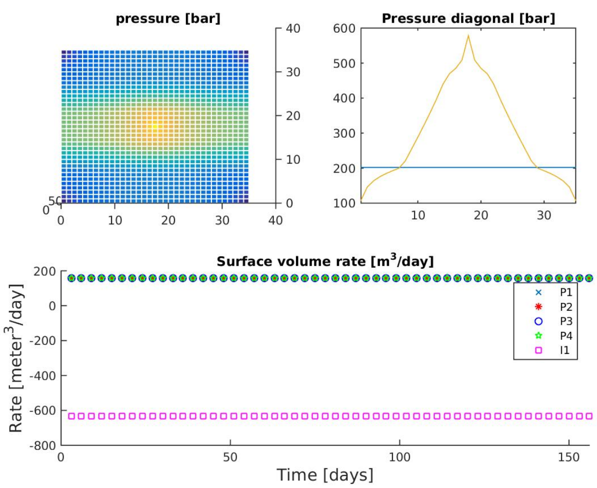

Figure 1: Solution, well fluxes

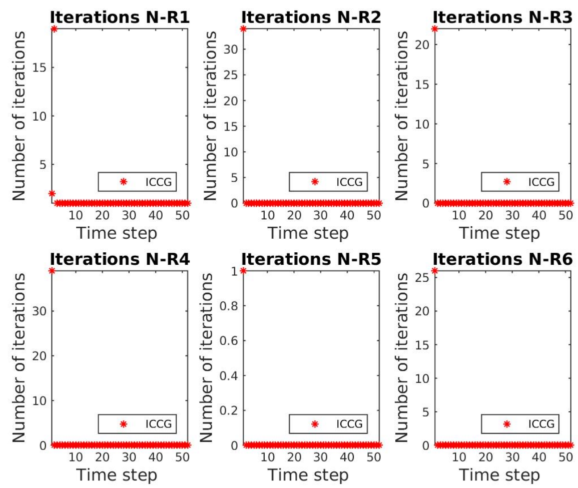

Figure 2: Number of iterations ICCG only

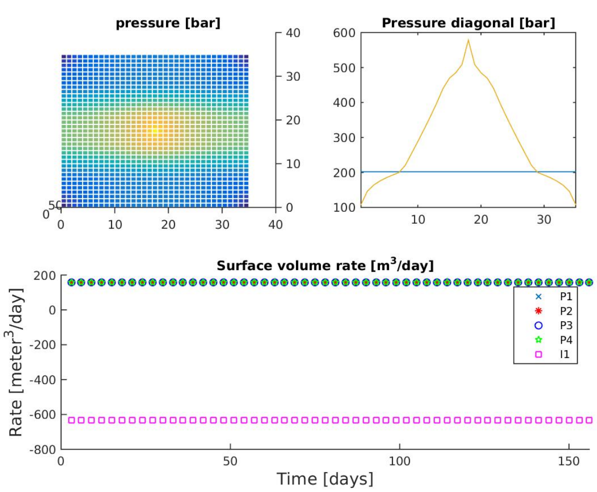

Figure 3: Solution, well fluxes

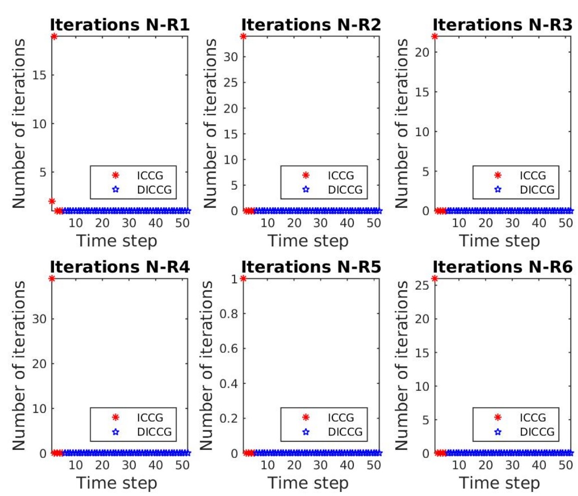

Figure 4: Number of iterations ICCG and DICCG

Compressible

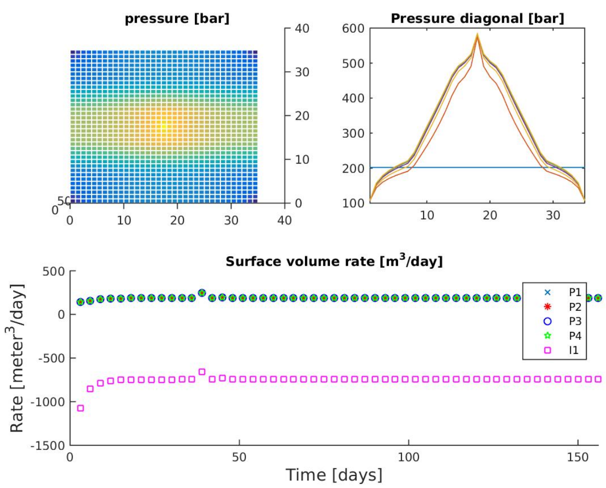

Figure 5: Solution, well fluxes

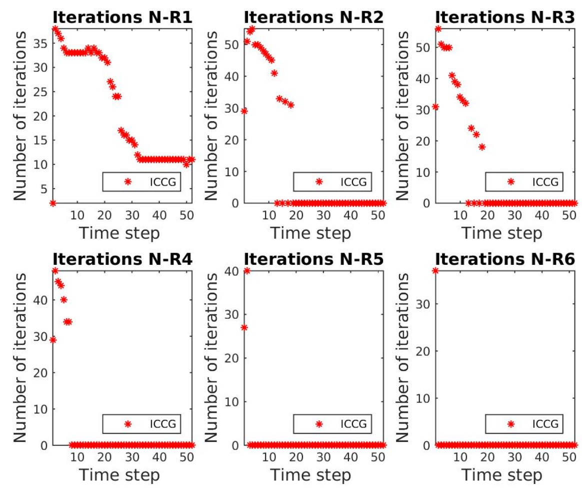

Figure 6: Number of iterations ICCG only

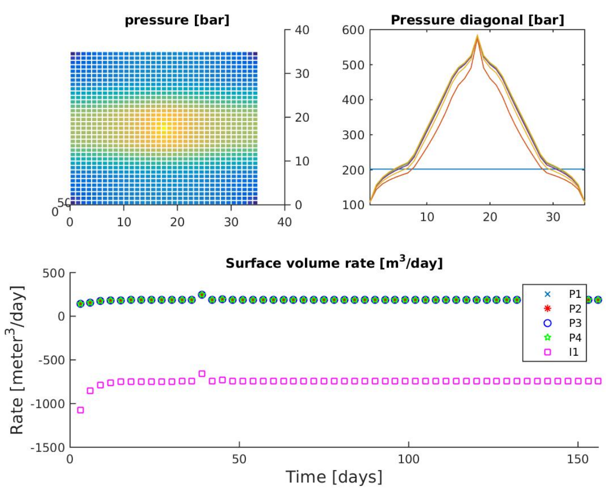

Figure 7: Solution, well fluxes

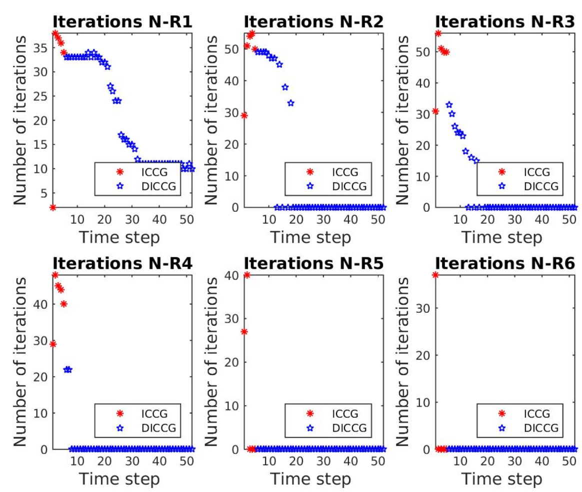

Figure 8: Number of iterations ICCG and DICCG

For the incompressible problem it works well, but for the compressible problem again we only observe changes after the 2nd NR iteration with the deflation method.
The residual of the NR iteration is

$$resNorm = norm(res) \leq tolNR,$$

and we use this residual as right hand side

$$A = J, \qquad b = res, \qquad y = upd.$$

I was thinking in two details, the first one is that if we have a good solution for the previous time step, this means that the residual of the NR iteration is small, and this is our right hand side, then we are dividing by a small number and maybe this can cause some problems.
We want to solve $Ay = b$, so if we already have an accurate $||b||_2 \approx tol$ then we should have $||Ay||_2 \approx tol$. Then I was thinking that maybe we can use this in the stopping criterium for the linear solver.