ADAPTIVE REFINEMENT RESULTS

Everywhere, we have 1 $\underline{\delta}$ layer, $\theta = 0.7$, mean-zero residual estimation unless specified otherwise.

Smooth solution

$u(t,x,y) = (1+t^2)x(1-x)y(1-y)$. We see nice rate 0.5 of the error, rate 1.0 of the $L2$-error at $t = 0$.

Time-singular solution

$u(t,x,y) = (1+t^{0.1})x(1-x)y(1-y)$. Quadrature order 5 in time. We see *very* strong refinement towards the origin (with wavelets around $t = 10^{-10}$). Suspect it is due to quadrature error.

Mildly singular solution

$u_0(x,y) := x(1-x)y(1-y)$ with $g = 1$ forcing data. Nice rate 0.5 with rate 1.0 for $L2$-error at $t = 0$.

Date: January 17, 2020.

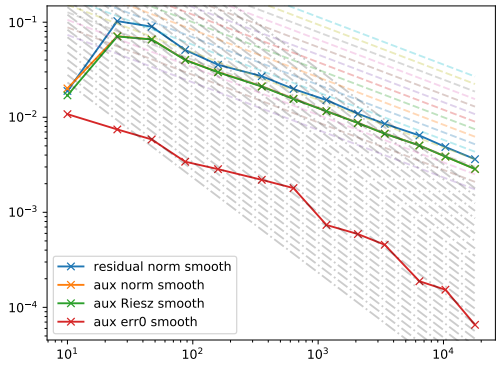

Figure 1. Smooth solution rate

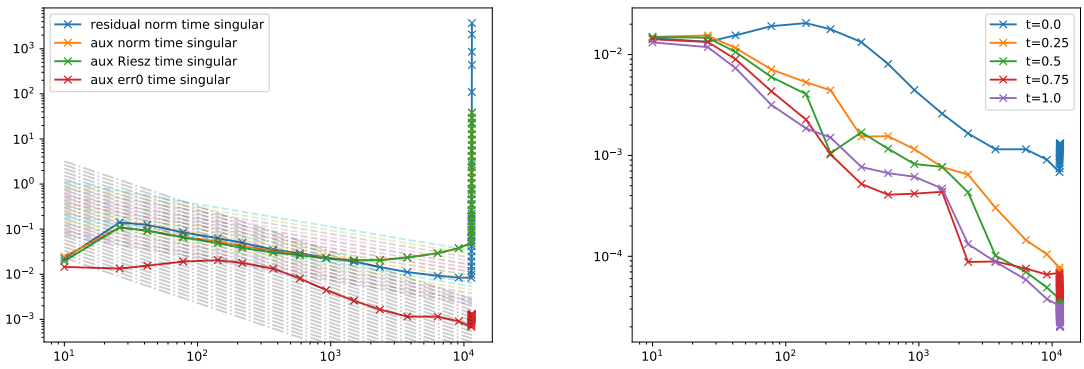

Figure 2. Time singular solution: left rate; right time-slice errors.

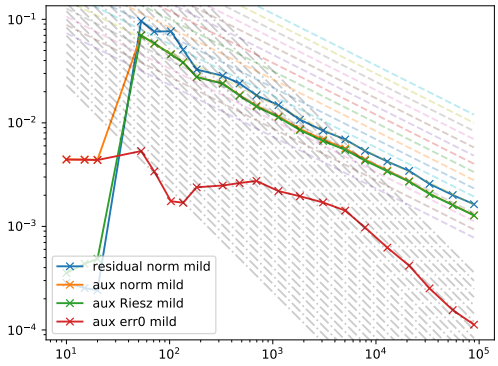

FIGURE 3. Mild singular solution rate.

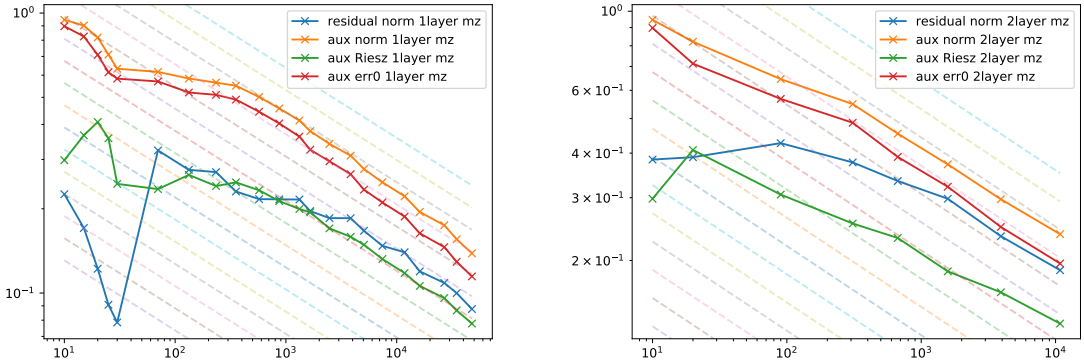

FIGURE 4. Strongly singular solution rates: left 1 layer, right 2 layers.

STRONGLY SINGULAR SOLUTION

$u_0(x, y) := 1$ with $g = 0$ forcing data. Clean rate 0.25 (where we had hoped 0.5).