1. Influence of d(x) and r(x) on the offset of the round-off error

We investigate the benchmark Poisson equation. We consider $\|d\|_2$ of order 1[1]. If not stated otherwise, P_2 elements are used for the standard FEM, and P_4/P_3^{disc} elements are used for the mixed FEM.

*1.1. d=1+0.5*sin*(cx), r=0*

For c being 1, 10 and 100, shapes of d are shown in Fig. 1, and $\|d\|_2$ are 1.23, 1.14 and 1.06, respectively. The analytical order of convergence can be reached within a number of h-refinements, and α_{R} are shown in Fig. 2, which are independent of d.

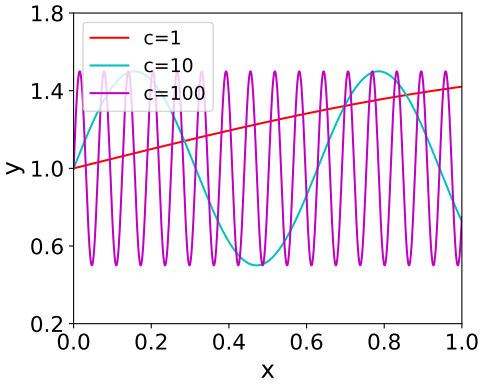
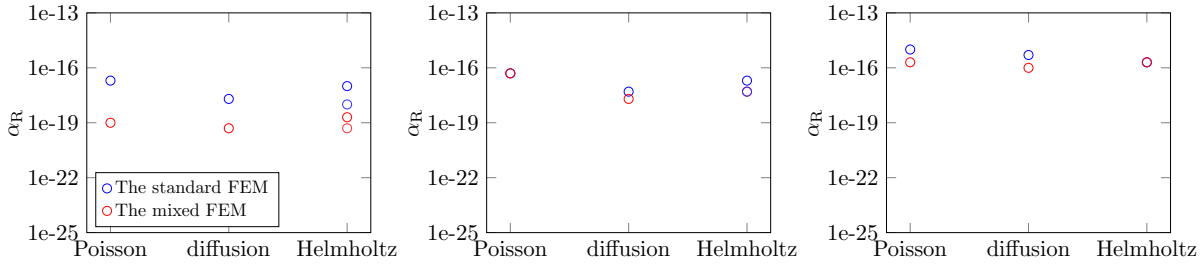


Fig. 1. Shape of $d = 1 + 0.5\sin(cx)$ for c being 1, 10, 100.

*1.2. d=1+0.5*sin*(x), r(x) = c*

Here, c is chosen to be 1, 10 and 100. It is found that both the truncation error E_{T} and round-off error E_{R} are independent of c.



(a) Solution **(b)** First derivative **(c)** Second derivative

Fig. 2. Influence of $d(x)$ and $r(x)$ on α_{R} for $p = e^{-(x-0.5)^2}$.

References

[1] Alexander S Chernetsky, Henk M Schuttelaars, and Stefan A Talke. The effect of tidal asymmetry and temporal settling lag on sediment trapping in tidal estuaries. *Ocean Dynamics*, 60(5):1219–1241, 2010.