Numerical results

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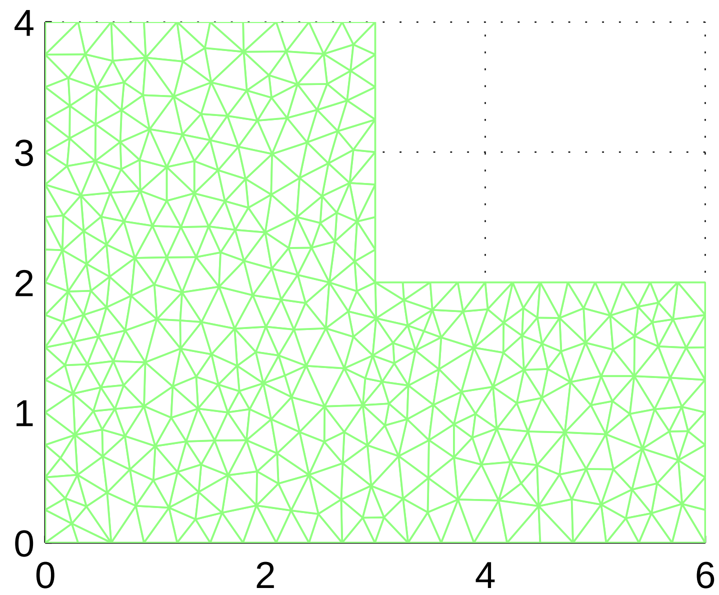
Characteristics of the meshes

- The model domain



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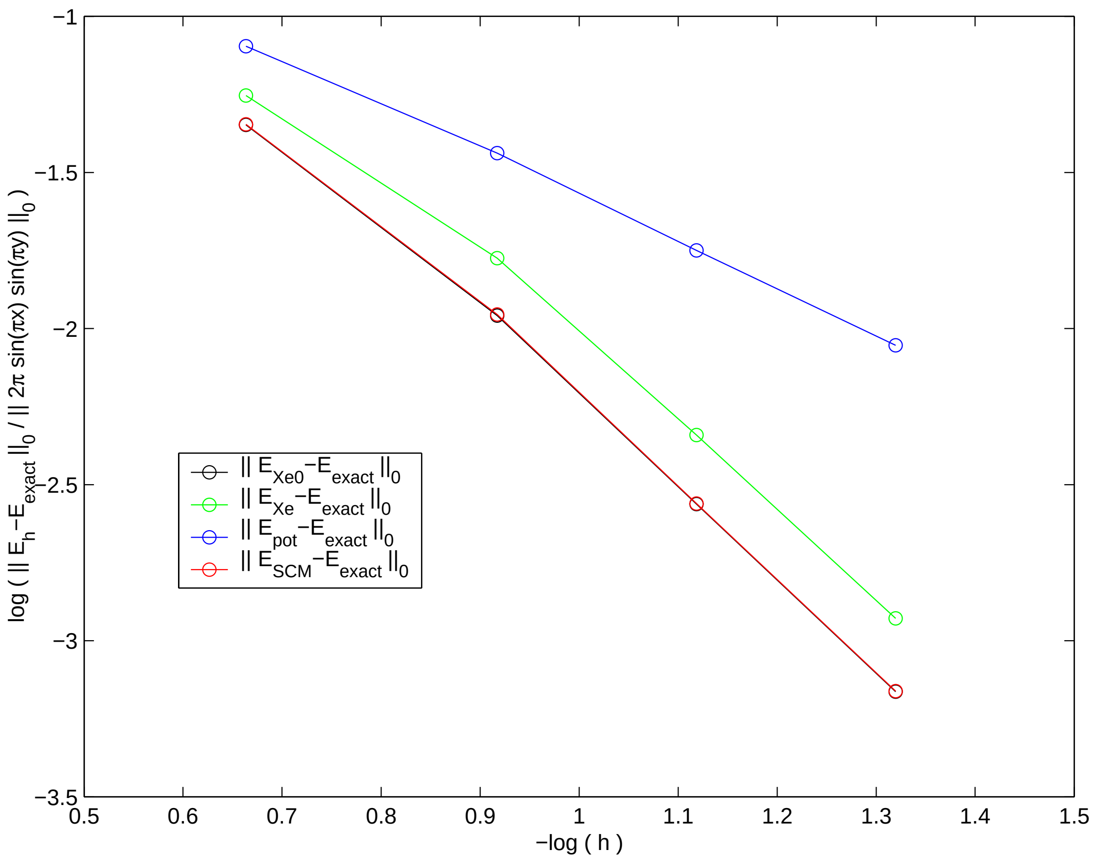
Mesh	1	2	3	4
Number of triangles	620	2780	9920	39680
Number of nodes	348	1315	5109	20137

Regular case, $L^2(\omega)$ norms

- $\text{div}\,\vec{E} = 2\pi \sin(\pi x)\sin(\pi y)$, $\text{curl}\,\vec{E} = 0$, $\vec{E}.\vec{\tau}_{|\gamma} = 0$,

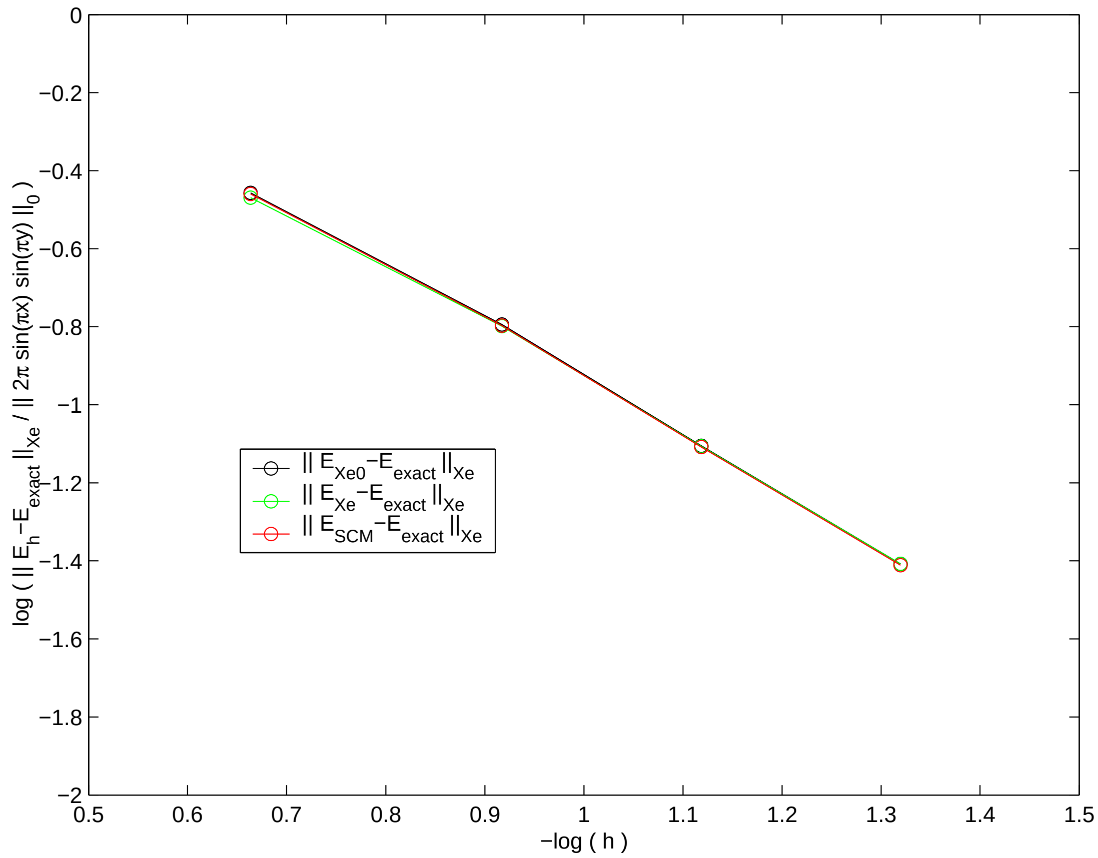
$$\vec{E}_{exact}(x,y) = -\begin{pmatrix} \cos(\pi x)\sin(\pi y) \\ \sin(\pi x)\cos(\pi y) \end{pmatrix}, \; ||2\pi \sin(\pi x)\sin(\pi y)||_0 = 4.16 \times 10^1.$$



Regular case, $\mathrm{X}_{\vec{E}}$ norms

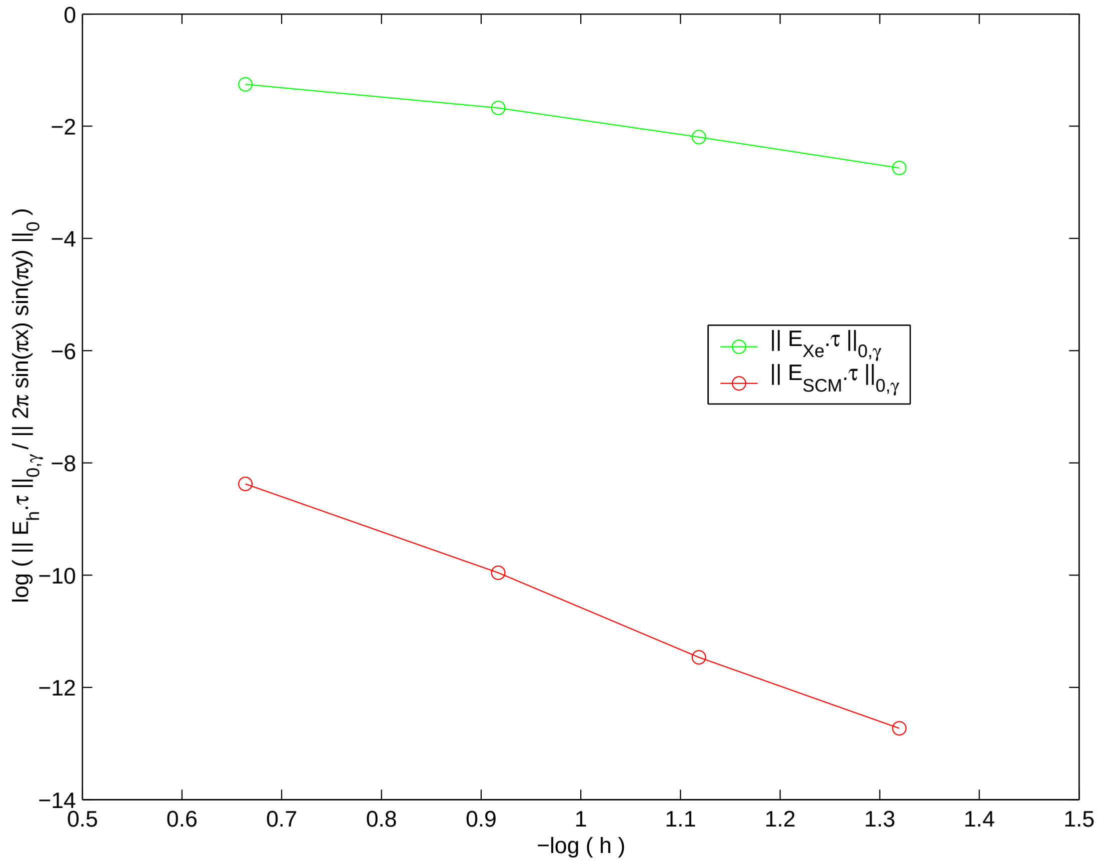
- $\mathrm{div}\,\vec{E} = 2\pi \sin(\pi x) \sin(\pi y)$, $\mathrm{curl}\,\vec{E} = 0$, $\vec{E}.\vec{\tau}_{|\gamma} = 0$,

$$||\vec{v}||^2_{\mathrm{X}_{\vec{E}}} = ||\mathrm{div}\,\vec{v}||^2_0 + ||\mathrm{curl}\,\vec{v}||^2_0 + \int_\gamma (\vec{v}.\vec{\tau})^2 d\gamma.$$



Regular case, $L^2(\gamma)$ norms

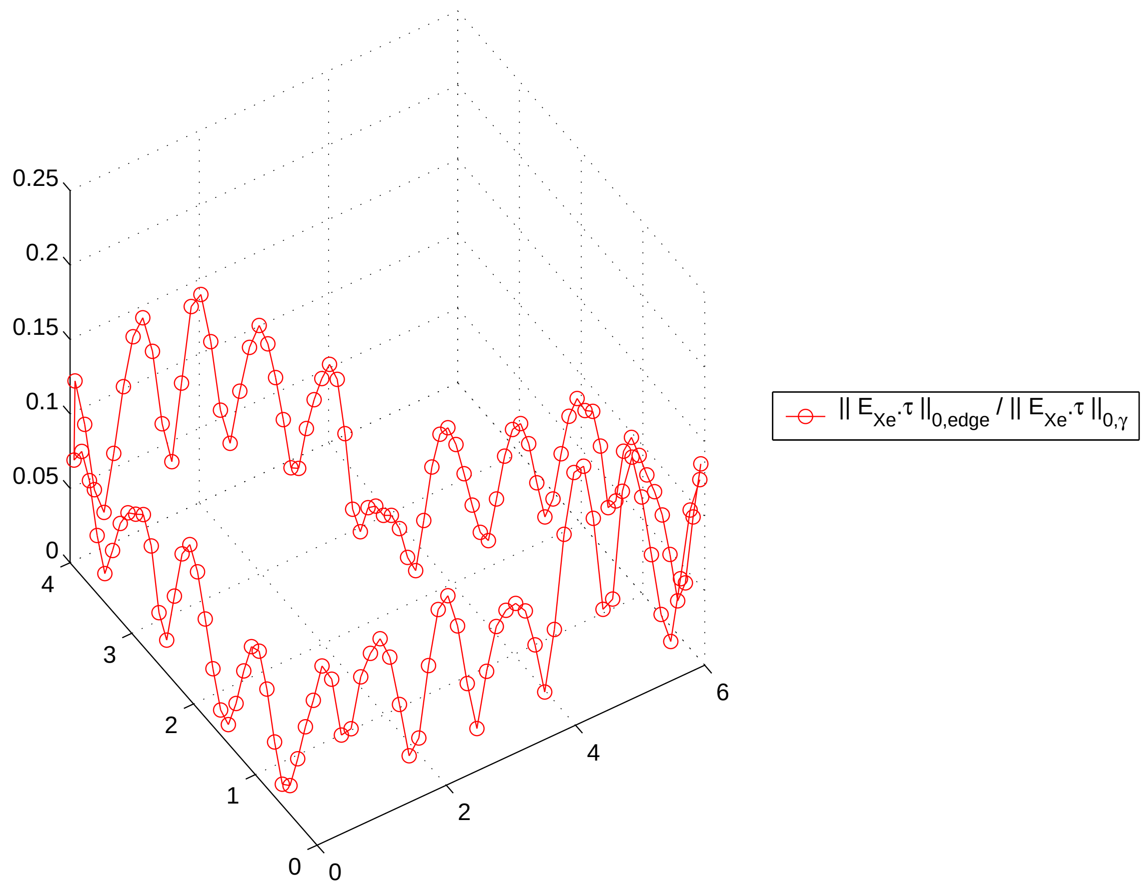
- $\text{div}\,\vec{E} = 2\pi \sin(\pi x)\sin(\pi y)$, $\text{curl}\,\vec{E} = 0$, $\vec{E}.\vec{\tau}_{|\gamma} = 0$.



Regular case, tangential component of $\vec{E}$ on γ

- $\text{div}\,\vec{E} = 2\pi \sin(\pi x)\sin(\pi y)$, $\text{curl}\,\vec{E} = 0$, $\vec{E}.\vec{\tau}_{|\gamma} = 0$,

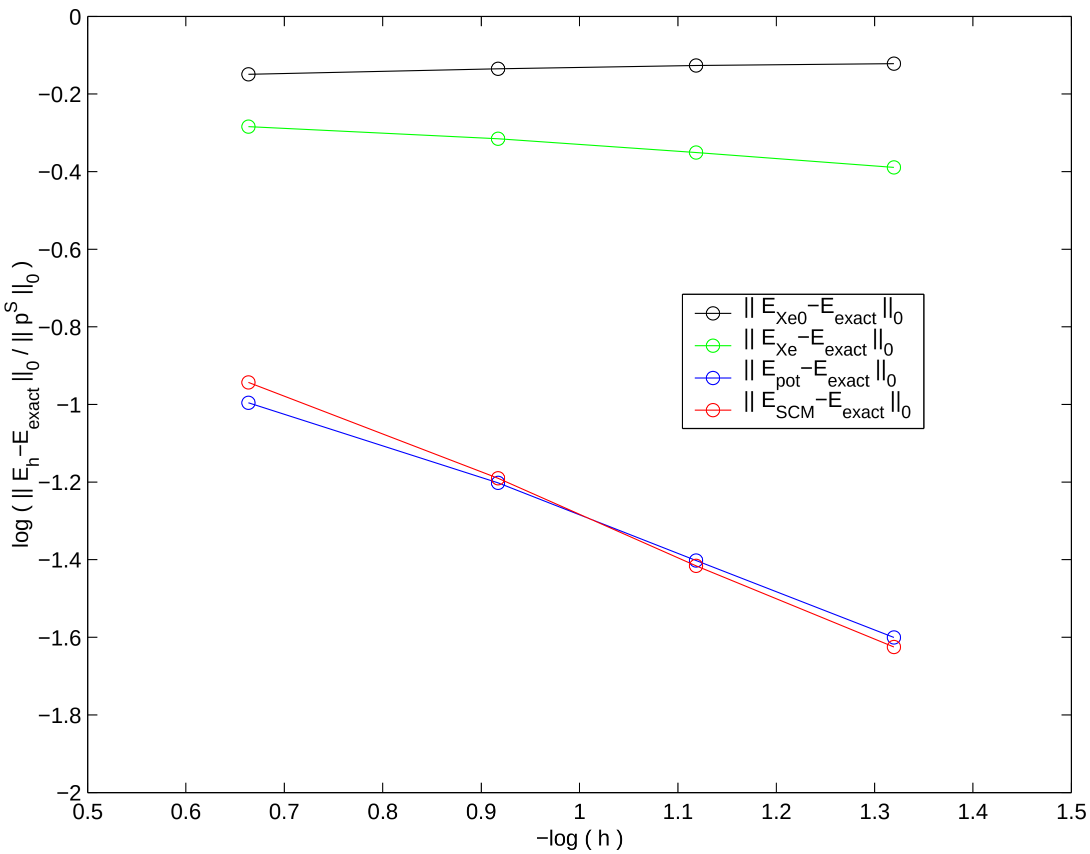
$||\vec{E}_{X_{\vec{E}}}.\vec{\tau}||_{0,\gamma} = 8.65 \times 10^{-1}$,
$||\vec{E}_{X_{\vec{E}}}.\vec{\tau}||_{0,\gamma}/||2\pi\sin(\pi x)\sin(\pi y)||_0 = 2.08 \times 10^{-2}$ on the second mesh.



Singular case, $L^2(\omega)$ norms

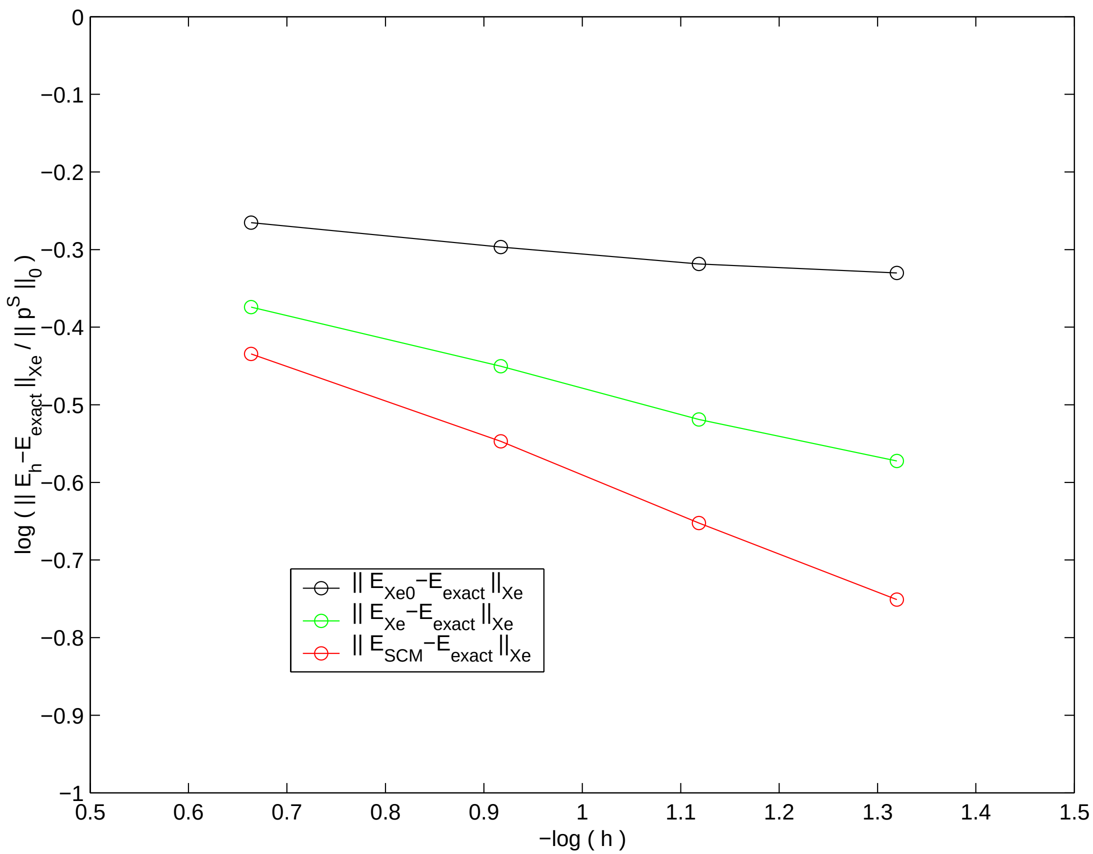
- div $\vec{E} = p^S$, curl $\vec{E} = 0$, $\vec{E}.\vec{\tau}_{|\gamma} = 0$, $\vec{E}_{exact} = -\vec{\text{grad}}\,\phi^S$, with :

$p^S = \tilde{p}_{H^1} + r^{-\frac{2}{3}} sin(\frac{2}{3}\theta)$, $\phi^S = \tilde{\phi}_{H^2} + \beta r^{\frac{2}{3}} sin(\frac{2}{3}\theta)$, $\beta = ||p^S||_0^2/\pi$.
$||p^S||_0 = 1.87$.



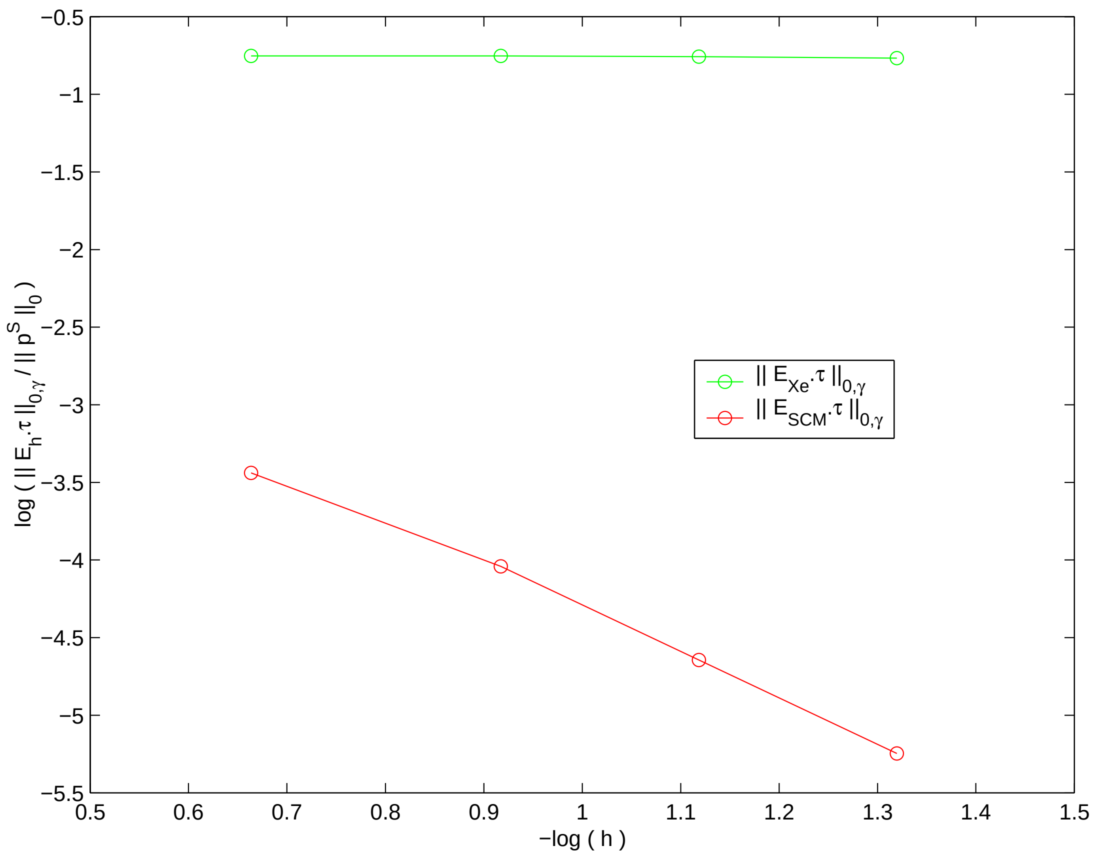
Singular case, $X_{\vec{E}}$ norms

- $\mathrm{div}\,\vec{E} = p^S$, $\mathrm{curl}\,\vec{E} = 0$, $\vec{E}.\vec{\tau}_{|\gamma} = 0.$



Singular case, $L^2(\gamma)$ norms

- $\text{div}\,\vec{E} = p^S$, $\text{curl}\,\vec{E} = 0$, $\vec{E}.\vec{\tau}_{|\gamma} = 0.$



Singular case, tangential component of $\vec{E}$ on γ

- $\text{div}\,\vec{E} = p^S$, $\text{curl}\,\vec{E} = 0$, $\vec{E}.\vec{\tau}_{|\gamma} = 0$.

$||\vec{E}_{X_{\vec{E}}}.\vec{\tau}||_{0,\gamma} = 3.31 \times 10^{-1}$, $||\vec{E}_{X_{\vec{E}}}.\vec{\tau}||_{0,\gamma}/||p^S||_0 = 1.77 \times 10^{-1}$ on the second mesh.