A Priori Error Estimates in Non-Energy Norms for the Two-Dimensional Signorini Problem

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This talk is concerned with error estimates for the piecewise linear finite element approximation of the two-dimensional scalar Signorini problem on a convex polygonal domain Ω. Using a Céa-type lemma, a supercloseness result and a non-standard duality argument, we prove $W^{1,p}(\Omega)$-, $L^p(\Omega)$-, $L^\infty(\Omega)$-, $W^{1,\infty}(\Omega)$- and $H^{1/2}(\partial\Omega)$-error estimates under mild assumptions on the contact sets of the continuous and the discrete solution. The obtained orders of convergence turn out to be optimal for problems with essentially bounded right-hand sides.

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