

# NEW INTERPOLATION RESULTS AND APPLICATIONS TO FINITE ELEMENT METHODS FOR ELLIPTIC BOUNDARY VALUE PROBLEMS

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ABSTRACT. We consider the the interpolation problem between  $H^2(\Omega) \cap H_D^1(\Omega)$  and  $H_D^1(\Omega)$ , where  $\Omega$  is a polygonal domain in  $\mathbb{R}^2$  and  $H_D^1(\Omega)$  is the subspace of functions in  $H^1(\Omega)$  which vanish on the Dirichlet part  $(\partial\Omega)_D$  of the boundary of  $\Omega$ . The main result is that the interpolation spaces  $[H^2(\Omega) \cap H_D^1(\Omega), H_D^1(\Omega)]_s$  and  $H^{1+s}(\Omega) \cap H_D^1(\Omega)$  coincide. An application of this result to a nonconforming finite element problem is presented.

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