

SUBSPACE INTERPOLATION WITH APPLICATIONS TO ELLIPTIC REGULARITY

CONSTANTIN BACUTA

ABSTRACT. In this paper, we prove new embedding results by means of subspace interpolation theory and apply them to establishing regularity estimates for the biharmonic Dirichlet problem, and for the Stokes and the Navier-Stokes systems on polygonal domains. The main result of the paper gives a stability estimate for the biharmonic problem at the threshold index of smoothness. The classical regularity estimates for the biharmonic problem are deduced as a simple corollary of the main result. The subspace interpolation tools and techniques presented in this paper can be applied to establishing sharp regularity estimates for other elliptic boundary value problems on polygonal domains.

MATHEMATICAL SCIENCES, UNIVERSITY OF DELAWARE, NEWARK, DE 19716, USA.
E-mail address: `bacuta@math.udel.edu`

1991 *Mathematics Subject Classification.* 35B30, 35B65, 35Q30, 46B70.

Key words and phrases. subspace interpolation, elliptic regularity, biharmonic operator, shift theorems, threshold index of smoothness, Stokes systems, Navier-Stokes systems.

This work was supported by NSF, DMS-0713125.