

CONDITION NUMBER ANALYSIS FOR VARIOUS FORMS OF BLOCK MATRIX PRECONDITIONERS*

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Dedicated to Richard S. Varga on the occasion of his 80th birthday

Abstract. Various forms of preconditioners for elliptic finite element matrices are studied, based on suitable block matrix partitionings. Bounds for the resulting condition numbers are given, including a study of sensitivity to jumps in the coefficients and to the constant in the strengthened Cauchy-Schwarz-Bunyakowski inequality.

Key words. preconditioning, Schur complement, domain decomposition, Poincaré–Steklov operator, approximate block factorization, strengthened Cauchy-Schwarz-Bunyakowski inequality

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