ON CONDITION NUMBERS FOR THE CANONICAL GENERALIZED POLAR DECOMPOSITION OF REAL MATRICES

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Abstract. Three different kinds of condition numbers: normwise, mixed and componentwise, are discussed for the canonical generalized polar decomposition (CGPD) of real matrices. The technique used herein is different from the ones in previous literatures of the polar decomposition. With some modifications of the definition of the componentwise condition number, its application scope is extended. Explicit expressions and computable upper bounds of these three condition numbers for the CGPD are presented. Besides, some first order normwise and componentwise perturbation bounds for the CGPD are also obtained. At last, some numerical examples are given to demonstrate the theoretical results.

Key words. Condition number, Canonical generalized polar decomposition, Perturbation analysis, Sensitivity.

AMS subject classifications. 15A12, 65F35.

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