# AN OPTIMUM ITERATION FOR THE MATRIX POLAR DECOMPOSITION[*]

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**Abstract.** It is shown that an acceleration parameter derived from the Frobenius norm makes Newton's iteration for the computation of the polar decomposition optimal and monotonic in norm. A simple machine-independent stopping criterion ensues. These features are extended to Gander's formulas for full-rank rectangular matrices.

**Key words.** Matrix polar decomposition, Newton iteration.

**AMS subject classifications.** 65F30, 65F35.

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