

CRITICAL EXPONENTS: OLD AND NEW*

CHARLES R. JOHNSON[†] AND OLIVIA WALCH.[†]

Abstract. For Hadamard and conventional powering, we survey past and current work on the existence and values of critical exponents (CEs) for such matrix classes as doubly nonnegative, totally positive, M- and inverse M-matrices. There are remarkable similarities and differences between Hadamard and conventional CEs for the various classes.

Key words. critical exponent, Hadamard powering, doubly nonnegative, totally positive.

AMS subject classifications. 15A16, 15A99.

^{*}Received by the editors on November 3, 2011. Accepted for publication on May 20, 2012. Handling Editor: Oskar Maria Baksalary.

 $^{^\}dagger Department of Mathematics, College of William and Mary, Williamsburg, VA, 23187 USA (cr-johnso@math.wm.edu and ojwalch@email.wm.edu).$