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Dominique Guillot* (dguillot@udel.edu), Department of Mathematical Sciences, University of Delaware, Newark, DE 19716, and **Mahya Ghandehari** and **Tina Torkaman**. *Critical exponents of graphs*.

Given a positive semidefinite matrix A with positive entries and a real number a , the entrywise power of A is obtained by taking the a -th power of each entry of A . Whether or not the resulting matrix must be positive semidefinite is a non-trivial problem solved in 1977 by FitzGerald and Horn. Motivated by applications in high-dimensional statistics, we examine when powering-up matrices with a structure of zeros encoded by a graph preserves positivity. I will discuss recent progress on the problem, and connections with the geometry of cones of structured positive semidefinite matrices. (Received September 19, 2016)