

## Some Norm-Like Functions for Matrices

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Unlike norms, our norm-like functions  $f(A)$  are zero iff the matrix  $A$  is acyclic. Examples are the sign-real and sign-complex spectral radius, our extension of Perron-Frobenius Theory to real and complex matrices, the maximum geometric mean of cycle products, the spectral radius of the absolute value of  $A$  and more. All functions can be bounded by each other by constants only depending on the dimension. A number of open problems remain.