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Ben Z Webb* (bwebb@mathematics.byu.edu), 1895 N. 1450 E., Provo, UT 84604, and **Leonid Bunimovich**. *Isospectral Graph Reductions and Improved Estimates of Matrices' Spectra*.

Via an isospectral graph reduction the adjacency matrix of a graph can be reduced to a smaller matrix while its spectrum is maintained up to some known (and possibly empty) set. It is then possible to estimate the spectrum of the original matrix by considering Gershgorin-type estimates associated with the reduced matrix. Our main result is that the eigenvalue estimates associated with Gershgorin, Brauer, Brualdi, and Varga improve as the matrix is reduced. Given that such estimates improve with each successive reduction, it is also possible to estimate the eigenvalues of a matrix with increasing accuracy by repeated use the isospectral reduction process. (Received September 18, 2017)