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Fumiko Futamura* (futamurf@southwestern.edu), 1001 E University Ave, Georgetown, TX 78626, and **Kendall Richards** and **Rick Denman**. *On Sharp Frame Diagonalization*.

We introduce a concept of diagonalization that uses not a basis of eigenvectors, but a frame. A frame is a generalization of a basis which is used in a number of signal and image processing applications. We describe several methods of constructing frames for frame diagonalization and prove a sharp result regarding the minimum size of a frame necessary to frame diagonalize a given matrix. (Received September 21, 2012)