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Mehmet Gumus* (mgumus@siu.edu) and **Jianhong Xu**. *A New Characterization of Simultaneous Lyapunov Diagonal Stability via Hadamard Products.*

A well-known characterization by Kraaijevanger (LAA 151: 245–254) for Lyapunov diagonal stability states that a real, square matrix A is Lyapunov diagonally stable if and only if $A \circ S$ is a P -matrix for any positive semidefinite S with nonzero diagonal entries. This result is extended here to a new characterization involving similar Hadamard multiplications for simultaneous Lyapunov diagonal stability on a set of matrices. Among the main ingredients for this extension are a new concept called \mathcal{P} -sets and a recent result regarding simultaneous Lyapunov diagonal stability by Berman, Goldberg, and Shorten (Contem. Math. 619: 19–29). (Received September 20, 2016)