1172-42-226   **Radu Balan**, 4176 Campus Drive, William Kirwan Hall, College Park, MD 20742, and **Chris Dock*** (`cdock@umd.edu`), University of Maryland, College Park, MD 20742. *Lipschitz Analysis of Generalized Phase Retrievable Frames.* Preliminary report.

The classical phase retrieval problem arises in contexts ranging from speech recognition to x-ray crystallography and quantum state tomography. The generalization to matrix frames is natural in the sense that it corresponds to quantum tomography of impure states. We provide computable global stability bounds for the quasi-linear analysis map β and a path forward for understanding related problems in terms of the differential geometry of key spaces. In particular, we manifest a Whitney stratification of the positive semidefinite matrices of low rank which allows us to "stratify" the computation of the global stability bound. We show that for the impure state case no such global stability bounds can be obtained for the non-linear analysis map α with respect to certain natural distance metrics. Finally, our computation of the global lower Lipschitz constant for the β analysis map provides novel conditions for a frame to be generalized phase retrievable. (Received August 29, 2021)