Development of An Eclipse Mapping Routine Using Python for Analysis of Kepler Data NATHAN SMITH, University of Dallas — A development and implementation of the eclipse mapping method using Python is discussed. The code utilizes Scipy's minimize function along with its various solving methods, primarily Sequential Least-Squares Programming (SLSQP). These methods are used to solve the maximum entropy equation with a chi-squared constraint to the observed photometric light curve. These methods are first evaluated on two-dimensional Gaussian test data with no chi-squared constraint and then used to image the accretion disks of the Cataclysmic Variable KIC 20132510, revealing its Gaussian structure. The structure of the code, along with potential design flaws, other errors, and parameter effects are examined. Factors such as the variance within the Gaussian weighting algorithm, the resolution of the disk image, the number of points within the observed light curve data, and the constraint level of the algorithm can drastically affect the quality of the image. The above methods and parameters are then considered as a whole and conclusions are drawn regarding the steps for further research. Finally, the code's GitHub repository is discussed for version control and open source development.

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