Moving MAVEN IUVS Science Data Processing into the Cloud. J. P. Elliott[1] and R. Heins[1], S. Carson[1] [1]Laboratory for Atmospheric and Space Physics, University of Colorado (joshua.elliott@lasp.colorado.edu, ryan.heins@lasp.colorado.edu, steve.carson@lasp.colorado.edu)

Introduction: The Imaging Ultraviolet Spectrograph (IUVS) is one of several instruments aboard the MAVEN spacecraft designed to interrogate the atmosphere of Mars and has been in orbit about the planet since 21 Sept 2014. Science data processing for IUVS is performed at the Laboratory for Atmospheric and Space Physics at the University of Colorado.

Currently we process these data on systems internal to LASP/CU. However, due to periodic mission reprocessing, the resources needed are ever increasing, proportional to the length of the mission. Therefore, we are exploring cloud-based resources to accommodate our needs.

The Need for the Cloud: MAVEN IUVS Processing occurs on regular semi-weekly intervals following data downlinks from the spacecraft. In addition, regular reprocessing of the entire mission dataset is periodically necessary due to changes in science data processing algorithms and/or data format changes, such as meta-data updates, or for ephemeris updates. A reprocessing of the full-mission dataset requires significant computational resources (i.e. core-hours) to complete. Originally, MAVEN was designed for a two-year mission. However, due to excellent spacecraft health and the fact that it will enjoy an extended life through 2030 as a relay-satellite for the upcoming Mars 2020 rover (and possibly other future missions), MAVEN science data will continue to be transmitted back to Earth for quite some time. This change in mission function, while certainly welcomed by the MAVEN team in general, presents new challenges for data reprocessing as the dataset grows.

The need for increasing resources has led us to explore cloud-based resources as an alternative. Full-mission reprocessing typically only occurs once or twice per year. The ability to dial up (or down) cloud resources at will is highly desirable since it will allow us to dynamically allocate the required resources on demand when a reprocessing is needed, as opposed to purchasing computational resources in house that we will only utilize for a fraction of the time.

Added Benefits: In addition, science team members (at geographically disparate locations) need the ability to log in to a centralized system in order to test new algorithms and process higher level data products derived from IUVS data. A cloud-based system seems ideal for remote team members to contribute.

Team members will be able log into the cloud-based system to experiment and process derived data products from the automatically generated lower level data products.

The Plan: We present a comparison of our current and planned data processing pipelines. Working in the cloud vs working with internal resources each have their own benefits and challenges. Transitioning IUVS to the cloud seems to offer the greatest number of benefits when considering the future volume of data that will be collected over the life of the MAVEN mission.