THE REXIS DATA ANALYSIS PIPELINE. D. Hoak¹, B. Allen¹, R. P. Binzel², M. Chodas², A. Cummings², J. Grindlay¹, D. Guevel¹, J. Hong¹, M. Lambert², L. F. Lim³, R. A. Masterson³, C. Thayer², Dante S. Lauretta⁴
¹Harvard University, Cambridge, MA, USA. ²Massachusetts Institute of Technology, Cambridge, MA, USA. ³NASA Goddard Space Flight Center, Greenbelt, MD, USA. ⁴Lunar and Planetary Laboratory, University of Arizona, Tucson, AZ, USA.

The Regolith X-ray Imaging Spectrometer (REXIS) [1,2] is designed to measure relative elemental abundances of key elements on the surface of the asteroid Bennu. REXIS detects the X-ray fluorescence spectrum from the surface (stimulated by the solar X-ray flux) over the range of energies 0.5 to 7 keV. REXIS is composed of an array of four back-illuminated CCDs, a coded aperture mask to constrain the incident angles of X-rays from Bennu's surface, and a Solar X-ray Monitor to provide an onboard measurement of the incident solar X-ray spectrum.

The REXIS data analysis pipeline is a suite of Python-based modules that calibrate, characterize, and model the data from the REXIS instrument. The end product of the analysis pipeline is the X-ray flux measurements from each element and the best-fit relative abundances that reproduce the observed flux, given the observation parameters and the incident solar spectrum.

In this presentation, we will describe the end-to-end steps of the REXIS analysis pipeline, demonstrate the calibration of the data across three years of in-flight operations, and report on the data quality and instrument performance from the observing period in July-August 2019.


Acknowledgements: This material is based upon work supported by NASA under Contract NN-M10AA11C issued through the New Frontiers Program and the OSIRIS-REx Team.