**OPTIMIZATION OF INSTRUMENT REQUIREMENTS FOR NASA’S GEOSTATIONARY COASTAL AND AIR POLLUTION EVENTS MISSION CONCEPT BASED ON SENSOR CAPABILITY AND COST STUDIES**

Antonio Mannino1**,** Instrument Design Lab Team2

NASA’s GEOstationary Coastal and Air Pollution Events (GEO-CAPE) mission concept recommended by the U.S. National Research Council (2007) focuses on measurements of atmospheric trace gases and aerosols and aquatic coastal ecology and biogeochemistry from geostationary orbit (35,786 km altitude). Geostationary offers the capability to image the same regions multiple times each day, which is critical to study process within estuaries and coastal oceans where the physical, biological and chemical processes react on short time scales from seconds to days. From geostationary orbit, a sensor can stare at the target location to gain sufficient signal-to-noise (SNR) to retrieve ocean reflectance during low light conditions (early morning and late afternoon) and at high satellite view angles. Furthermore, the flexibility of scanning throughout the day allows for greater opportunity to obtain non-cloudy pixels at any given location due to temporal variability in cloud cover. Three instrument design lab (IDL) studies were commissioned in 2014 to design and cost two implementations for geostationary ocean color instruments (1) Wide-Angle Spectrometer (WAS) and (2) Filter Radiometer (FR) and (3) a cost scaling study to compare the costs for implementing different science performance requirements. These studies intended to allow the assessment of the impact of various science requirements, including spatial and spectral resolution, spectral range, scanning rate and SNR, on the instrument cost. Multiple instrument concepts were examined to capture a broader range of costs that might be associated with different types of instruments. Results on the cost versus capability will be presented.

1antonio.mannino@nasa.gov, NASA Goddard Space Flight Center, Mail Code 616.1, Greenbelt, MD; 2tammy.l.brown@nasa.gov, NASA Goddard Space Flight Center, Mail Code 550.0, Greenbelt, MD