# QUANTITATIVE EVALUATION OF MODIS FIRE RADIATIVE POWER MEASUREMENTS FOR GLOBAL SMOKE EMISSIONS ASSESSMENT

**ICHOKU Charles[1], ELLISON Luke[1,2]**

**[1]NASA Goddard Space Flight Center, Greenbelt, Maryland, USA.**
**[2]Science Systems & Applications, Inc. (SSAI), Lanham, Maryland, USA.**

**Charles.Ichoku@nasa.gov**
**Luke.Ellison@nasa.gov**

Satellite remote sensing is providing us tremendous opportunities to measure the fire radiative energy (FRE) release rate or power (FRP) from open biomass burning, which affects many vegetated regions of the world on a seasonal basis. Knowledge of the biomass burning characteristics and emission source strengths of different (particulate and gaseous) smoke constituents is one of the principal ingredients upon which the assessment, modeling, and forecasting of their distribution and impacts depend. This knowledge can be gained through accurate measurement of FRP, which has been shown to have a direct relationship with the rates of biomass consumption and emissions of major smoke constituents. Over the last decade or so, FRP has been routinely measured from space by both the MODIS sensors aboard the polar orbiting Terra and Aqua satellites, and the SEVIRI sensor aboard the Meteosat Second Generation (MSG) geostationary satellite. During the last few years, FRP has steadily gained increasing recognition as an important parameter for facilitating the development of various scientific studies and applications relating to the quantitative characterization of biomass burning and their emissions. To establish the scientific integrity of the FRP as a stable quantity that can be measured consistently across a variety of sensors and platforms, with the potential of being utilized to develop a unified long-term climate data record of fire activity and impacts, it needs to be thoroughly evaluated, calibrated, and validated. Therefore, we are conducting a detailed analysis of the FRP products from MODIS to evaluate the uncertainties associated with them, such as those due to the effects of satellite variable observation geometry and other factors, in order to establish their error budget for use in diverse scientific research and applications. In this presentation, we will show recent results of the MODIS FRP uncertainty analysis and error mitigation solutions, and demonstrate their implications for biomass burning emissions assessment.