

Sounding rocket EVE supporting tune-up of SDO EVE instrument

May 19 2016, by Keith Koehler



NASA Black Brant IX sounding rocket. Credit: NASA

Satellites provide data daily on our own planet, our sun and the universe around us. The instruments on these spacecraft are constantly bombarded with solar particles and intense light, not to mention the normal wear and tear from operating in space.

If it were a car that's a few years old, you would take it to the mechanic for a tune-up to make sure it continues running smoothly. However, with a spacecraft it's not that easy. Thus, scientists may turn to calibration flights to make sure the instruments are kept up to snuff and providing validated data.

One such flight will be the Extreme UltraViolet (EUV) Variability Experiment, or EVE, from the University of Colorado, Boulder, to observe the sun from a NASA Black Brant IX sounding rocket at 3:02 p.m. EDT May 25 at the White Sands Missile Range in New Mexico.

"The experiment's primary goal is to provide the under-flight calibration for the SDO EVE spectrometers and the solar EUV imager aboard SDO," said Tom Woods, the principal investigator for this mission as well as the EVE instrument on NASA's Solar Dynamics Observatory, or SDO. "The calibration rocket measurements also support the calibration and validation for several other solar soft X-ray and [extreme ultraviolet](#) spectrometers and imagers on NASA solar observatories."

The sounding rocket flight will be the eighth calibration flight of the EVE rocket instrument. After suffering a launch vehicle failure on a flight in May 2015, the instruments were recovered, refurbished and are

ready for this mission, according to Woods.

The flights of the sounding rocket EVE instrument have been conducted since 2006 with the first launches to calibrate the solar EUV instrument aboard NASA's TIMED satellite. With the launch of SDO in February 2010, unprecedented information has been received on our closest star that includes over 10 million EUV spectra and over 100 million solar images.

Woods said, "There is a lot of science and many exciting—some unexpected—results from the SDO satellite measurements. For example, while most EUV emissions increase during a solar flare, some emissions decrease, or dim, during a flare, and this dimming is providing new information about the mass loss during eruptive flare events. This calibration rocket flight contributes to those satellite measurements by providing the most accurate and updated [calibration](#) for the satellite instruments. It is invaluable for helping to understand how the satellite instruments are degrading."

He continued, "One of the unexpected results in analysis of the instrument degradation trends, especially the spectral signature of the degradation trend for SDO EVE, is that most of the degradation in some of the EUV instruments is from oxidation of the metal foil filters and not from hydrocarbon contamination as has been the case for past satellite missions. In other words, despite the fact that SDO is a very clean spacecraft (with no significant hydrocarbon contamination), the satellite instruments still are degrading in space."

The EVE on the 56.5-foot Black Brant IX [sounding rocket](#) is expected to fly to approximately 180 miles altitude during a 16-minute flight and provide about five minutes of solar viewing time. For Woods and his team this is all the time needed to gather data for a tune-up of the various [satellite instruments](#).

Provided by NASA's Goddard Space Flight Center

Citation: Sounding rocket EVE supporting tune-up of SDO EVE instrument (2016, May 19)
retrieved 8 April 2024 from

<https://phys.org/news/2016-05-rocket-eve-tune-up-sdo-instrument.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--