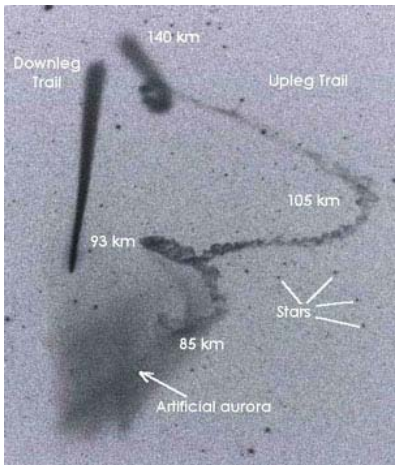
Introduction
Work Groups
MI Conferance
CDR Conference
Integration
Launch
Outreach
Media
Members
Links
Contact
Home

SPIRIT II's Trimethyl Aluminum Release Experiment

Atmospheric scientists have used Trimethyl Aluminum or TMA releases for decades as a tracer element of the neutral winds of the upper atmosphere. TMA is a chemical that burns brightly when it comes into contact with oxygen--as it is released from the payload during the rocket's flight, it leaves a chemical trail behind. At night, the trail glows brightly and can easily be seen and photographed from earth. Over time, the trail becomes deformed due to the interaction with neutral wind, by taking photographs, the position and velocity of the trail as it deforms may be determined.

The negative image below shows two TMA trails and an artificial aurora created by introduction of chemicals into the atmosphere during the experiment.



One trail (the twisted one) was released on the upleg journey of the rocket and the other trail (the straight one) was released on the downleg trajectory of the same rocket. This image shows the downleg trail is still in the process of being released. Since the downleg trail has just been released, the neutral wind has not had time to reshape that trail. The artificial aurora was created by residual kerosene in the TMA canister. Since this is a negative image, the stars and trails appear dark. This image was taken during a Clemson University rocket campaign at White Sands Missile Range in New Mexico. The photo was taken from Albuquerque.

The TMA trails will be photographed by students from both Clemson and Penn State, Clemson students are currently coordinating the efforts. Student contacts for the TMA experiment are Joe Ziska at Clemson University and Kate Boland at Penn State.

Back to Experiments