

Sounding Rocket Mission Fact Sheet

Mission: Turbulent Oxygen Mixing Experiment Plus (TOMEX-Plus)

Mission Number(s): 41.123 & 41.124 CE

Principal Investigator: Dr. Clemmons/University of New Hampshire

Launch Date: August 17, 2025 (window open)

Launch site: Wallops Island, VA



Science Discipline:
Geospace Science

Payload:
435.9/431.4 lbs

Nose cone

TMA section

Telemetry

Motor Adapter

Second Stage:
Improved Orion

Thrust:
>20,000 lbs

First Stage:
Terrier Mk 12

Thrust:
>40,000 lbs

Description

The 41.123 and 41.124 TMA release payloads combined with the 36.335 Lidar/Winds instrumentation payload, a ground based Lidar, and a ground based imager comprises the Turbulent Oxygen Mixing Experiment Plus (TOMEX-Plus). The TOMEX-Plus mission is based on the 21.126-.127 TOMEX mission (WSMR/2000).

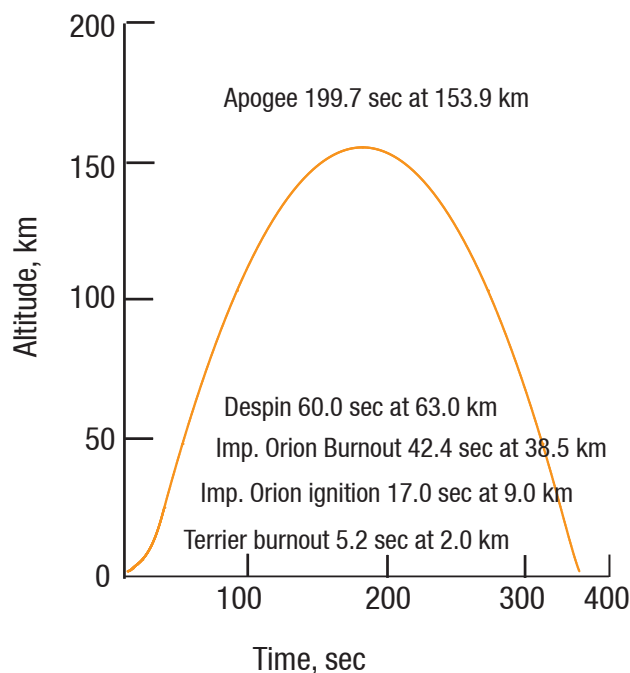
Core scientific question to be examined by TOMEXplus:

How are turbulence and the mixing of atomic oxygen related to each other and to underlying instabilities?

This question is addressed through the three scientific objectives for TOMEXplus:

- Determine how the vertical profile of the atomic oxygen mixing ratio varies as the atmosphere changes from regions of large layered turbulence at or below the mesopause to decreasing and possibly vanishing turbulence around the turbopause.
- Determine the horizontal variations in the atomic oxygen density that can be related to variations in turbulent fluctuations.
- Characterize the 3D turbulence spectrum, its spatial variability and relationship to larger scale features of the flow, especially those related to instabilities.

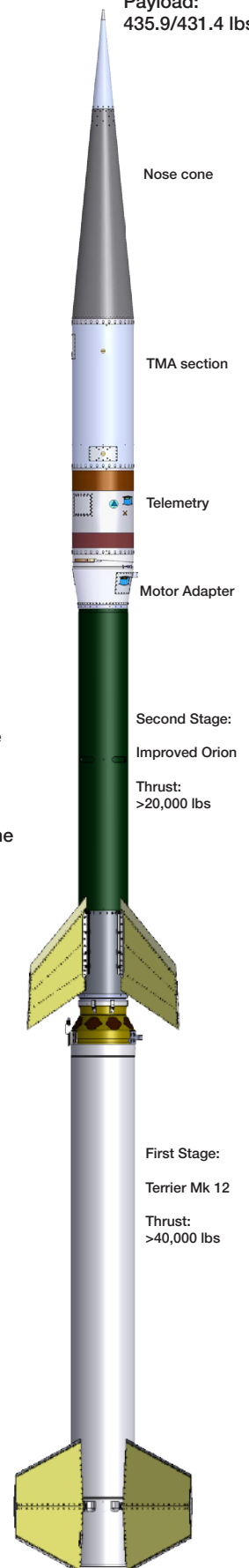
The TMA and instrumentation payloads will pass through 90 km altitude on the downleg at the same range with the TMA trails centered at the 90 km altitude. 41.123 will launch at T-0, 41.124 at T=1 min and 36.335 at T+ 5 min 30 sec. A separate fact sheet is available for 36.335.

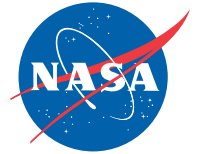


TMA Release

Upleg release starts at 80 km for a 90 second duration.

Downleg release starts at 140 km for a 90 second duration.





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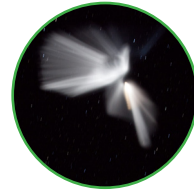
Mission: Turbulent Oxygen Mixing Experiment Plus (TOMEX-Plus)

Mission Number(s): 36.335 CE

Principal Investigator: Dr. Clemmons/University of New Hampshire

Launch Date: August 17, 2025 (window open)

Launch site: Wallops Island, VA



Science Discipline:
Geospace Science

Description

The 41.123 and 41.124 TMA release payloads combined with the 36.335 Lidar/Winds instrumentation payload, a ground based Lidar, and a ground based imager comprises the Turbulent Oxygen Mixing Experiment Plus (TOMEX-Plus). The TOMEX-Plus mission is based on the 21.126-.127 TOMEX mission (WSMR/2000).

Core scientific question to be examined by TOMEXplus:

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