NASA STUDENT LAUNCH MEDIA SHEET

National Aeronautics and Space Administration

Marshall commentators will share this information with viewers during live broadcasts, videos, social, etc.

TEAM NAME: Madison West Rocket Club

SCHOOL: Madison West High School

NAME OF PRIMARY SPOKESPERSON *(For Interview)*: Everett Gihring

ROCKET NAME: Isthmus Uncle

PAYLOAD *(Very basic description for the media)*:
Project SLOSH (Student-Led Observations of Sinusoidal Hydrodynamics) seeks to evaluate "baffle" design to reduce water sloshing and slamming in liquid fuel or storage tanks. Slosh is defined as "any motion of the free liquid surface inside its container caused by disturbance to partially filled liquid containers," according to Ibrahim (2005) in the book "Liquid Sloshing Dynamics: Theory and Applications". Baffles are often used to mitigate the sloshing effect, which can cause risk due to slamming on the tank walls.

We are conducting experiments with different configurations of these baffles (vertical and grid) to reduce water sloshing and slamming in containers. Findings from this work can apply to liquid fuel and volatile compound tank design in rockets, road transportation, and buildings subject to inertial forces, where sloshing can prevent proper transfer into the engine or delivery mechanisms or where big masses of moving liquid could cause instability.

The payload consists of three rectangular cross section tanks, one control, and two with different baffle design, with a semi-clear front and LED lighting. Three high-resolution cameras record 120 Hz imagery of sloshing of colored liquid water in each tank, time synced with controlled light sequences. On recovery, SD card imagery from each camera is discretized into a grid of filled water values per column and row. The difference in time rate of change in average values of column height/fill is then compared across the three tanks in each stage of flight, to determine whether and when each baffle design statistically and significantly reduced slosh relative to the control.

NUMBER OF TEAM MEMBERS: 15

SOCIAL MEDIA LINKS:
Instagram: https://www.instagram.com/westrocketry?igsh=MTkwYW5ycmFwYW5pcQ%3D%3D&utm_source=qr
Facebook: https://www.facebook.com/madison.west.rocketry/
YouTube: https://www.youtube.com/channel/UCpWKykZQ88D42TML7iF4bYA
Website: https://madison-west-rocketry.github.io/SL/

PREVIOUS AWARDS IN THIS COMPETITION (*If applicable):* N/A

INTERESTING INFORMATION

- HOW MANY YEARS HAVE YOU COMPETED/PARTICIPATED IN STUDENT LAUNCH?

- The Madison West Rocket Club has participated in Student Launch 14 times, its first appearance being in 2006.

- WHAT DIFFICULTIES DID YOU OVERCOME THIS YEAR?
  - We encountered difficulties with the scope of our payload and producing repeatable results from our vehicle. We overcame this by adjusting our payload to fit our capabilities and performing ground tests to evaluate the performance of our vehicle.
- HOW MANY TEST FLIGHTS AND WERE ALL YOUR TEST FLIGHTS SUCCESSFUL?
  - Our scale model flight was successful
  - Our first VDF attempt experienced a motor nozzle failure
  - Our second VDF/PDF attempt experienced a flight controller programming error, as well as a payload that we wanted to add to
  - Our third VDF/PDF attempt was successful
- WHO ARE YOUR SPONSORS OR CONTRIBUTORS?
  - Fundraising through local yard-raking programs
  - Parent contributions for supplies, chaperoning, shuttling students, etc.
  - Various aerospace professionals for feedback on our project
- WHOM WOULD YOU LIKE TO THANK?
  - Christine Hager (Lead Educator)
  - All of our club mentors (Max Jetzer, Easton Bednarek, Brent Lillesand, Ankur Desai, Tom Gihring, and Jim Guither)
  - All of our parent chaperones and supporters
  - All of our fundraising clients and supporters
- WHAT ADVICE DO YOU HAVE FOR YOUNGER STUDENTS INTERESTED IN AEROSPACE/ENGINEERING?
  - Get involved with local clubs and organizations, meet people, and create connections.
- WHICH COURSES HAVE HELPED THE MOST IN THIS PROJECT?
  - Physics for modeling rocket flight and understanding results, English/Writing Workshop classes for crafting well-written documentation.
- WHAT WAS THIS YEAR'S MOST REWARDING EDUCATIONAL ENGAGEMENT EXPERIENCE?
  - The team has learned how to work together to develop solutions to complex problems and efficiently present those solutions to a third party. The team has gained skills in professional writing, time management, and problem-solving.
- DOES YOUR TEAM HAVE ANY FUN TRADITIONS?
  - Referencing a well-known rocket within the club from previous years named "Island Boy," the team has given their rocket several spin-off names for each full-scale launch, including "Island Man," "Peninsula Girl," "Isthmus Woman" (a nod to the team being based in Madison, WI, which is located on an isthmus between two lakes), and, finally, "Isthmus Uncle."