

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Safe Transportation Systems for Sustainable Commercial Human Spaceflight / Small Launchers: Concepts  
and Operations (Part II) (9-D6.2)

Author: Mr. Jared Fuchs  
University of Alabama in Huntsville, United States, jef0011@uah.edu

Mr. Benjamin Thompson  
University of Alabama in Huntsville, United States, brt0011@uah.edu

OVERVIEW OF THE SABER MISSION AND LAUNCH VEHICLE DESIGN

**Abstract**

The Suborbital Atmospheric Balloon Elevated Rocket (SABER) is an amateur rocket mission being developed by students at the University of Alabama in Huntsville, United States. The objective of the mission is to develop the infrastructure to take a 1-4 kg science payload to space. The first iteration of the SABER vehicle is an amateur rocket lifted via balloon to 30 km and launched to an ultimate altitude of 100 km. High altitude rocket launches significantly reduce the role of drag thereby increasing the range capabilities of standard solid propellant rocket motors. The rocket booster will initially use common amateur low cost rocket designs adapted to challenges for high altitude launch and recovery. Once the infrastructure is in place for a successful launch, capabilities will be expanded upon to allow for flights with a higher ultimate altitude. The SABER project will allow a university team the capabilities to go farther, faster, and higher than a standard ground launch rocket can accomplish. The team is developing the preliminary single stage rocket booster, launch gondola platform, and balloon envelope. Current mission timeline has a targeted launch of the initial vehicle system in 2019. We will present an overview of the SABER mission objectives, principle capabilities, simulations, and current design of the vehicle's primary systems.