

Abstract

For the *European Conference for Aerospace Sciences* (EUCASS)

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Project:

"AQUASONIC"- A Project in the Frame of the DLR "STERN" Programme

Objectives:

The Project „AQUASONIC“ is aimed to develop a two-stage sounding rocket transporting a 2kg payload to a ceiling of 10 km while reaching a velocity of at least Mach 1.

Concept, design and realisation of the optimised, lightweight rocket system will be performed by graduate and undergraduate Aerospace and Aviation students of Hochschule Bremen during their final phase of studies. Through the project the students will get the opportunity to apply their knowledge and skills acquired during their theoretical study course work.

At the beginning, the teaching project will be focused on the preliminary design of the two rocket stages and the complete rocket assembly.

The technical realisation of the two stages using different propulsion systems will be performed during final project work of the students.

To test the two rocket stages they will be realised and flown as single rockets first before assembly to the final rocket configuration. The two stages will have masses of 20-40 kg (1st stage) and 10-20 kg (2nd stage) respectively.

To launch the two-stage system having a launch mass of 30-60 kg, the ESA ESRANGE launch site in Kiruna, Sweden is foreseen.

Current activities:

Since the project start on January 1st, 2013 four student groups are competing in the preliminary design process of the rocket. In this process the rocket assembly consisting of the two stages along with the respective propulsion systems are defined. A fifth group is defining the payload.

Schedule:

The concept phase will be finished in July 2013 followed by the first stage detailed design and realisation phase leading to the test launch of the first stage scheduled for spring 2014. In January 2014 realisation of the second stage will start with first test launch at end of 2014. After integration to the two-stage system and intensive ground testing, first two-stage rocket launch is expected for late 2015.