

# Progress Update of the DLR STERN Project at the University of Stuttgart

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The Student Group HyEnD (Hybrid Engine Development) at the University of Stuttgart is participating with the Institute of Space Systems (IRS) in the DLR STERN program initiated by the DLR Space Administration. In the course of this three year program students shall design, develop and fly a small sounding rocket. The basic technical requirements are a minimum flight altitude of 3 km, recording and transmission of telemetry data and the recovery of the rocket by a parachute system. The project at the University of Stuttgart started in September 2012. The launch campaign of the rocket is planned to be at the end of the three year program. Due to the expected high flight altitude the launch will take place at the European Space and Sounding Rocket Range (Esrange) in Kiruna, Sweden.

In the course of the program two demonstrators shall be built before the sounding rocket with a planned flight altitude of 20 km. The first demonstrator is a small rocket with a planned flight altitude of 2 km and the second demonstrator is a hybrid engine demonstrator with an initial thrust level of 2500 N, which shall be increased in the course of the test program to the final goal of 10kN – the planned design thrust of the sounding rocket. The hybrid rocket engines are operated with nitrous oxide and paraffin as propellants.

In this paper the progress of the demonstrators and the project status will be documented in detail. Results of the first hot fire tests of the small rocket demonstrator engines are presented. The overall design status of various aspects of the program including aerodynamic and structural analysis and the next planned steps will be presented.