

LOW BALLISTIC COEFFICIENT RE-ENTRY PROBE
FOR THE INTERNATIONAL PLANETARY PROBE WORKSHOP 2010
(IPPW-7)

Kevin Ramus*, Brandy Holmes, Anna Camery, David Eld, Rory Riggs, Randall Gunn, David H. Atkinson, and the Idaho Near Space Engineering Team

University of Idaho
e-mail: kevinramus@vandals.uidaho.edu

ABSTRACT

There are regions of the Earth's atmosphere that are especially difficult to study. One of these is between 30km and 100km. NASA Ames has been developing scientific payloads to fly on sounding rockets to reach this region. Since 2007, the University of Idaho Near Space Engineering program has worked with the SOAREX program at NASA Ames to develop low-ballistic coefficient descent systems for slow descent through the 30-100 km region. The current project comprises of a small 2.2 kg probe beneath a parachute with an area of about 1.35 square meters. This system allows the probe to descend very slowly and allows for large amounts of data to be gathered in the upper atmosphere. The probe, equipped with a PCB board that includes 3 temperature sensors, 2 pressure sensors, an accelerometer, a Geiger counter, a GPS unit and a beacon for tracking, and an SD card for data acquisition and storage, will be deployed at about 85-90 km. The data is recorded as a function of altitude, and the pressure and temperature sensors are used to determine the elevation and descent speed. Since a GPS is being used for tracking, the accuracy of the calculated descent trajectory profile can be determined. Measurements of atmospheric pressure and temperatures will characterize the atmospheric structure along the descent path.

The delivery of the flight capsule to NASA Ames is scheduled for late March or early April. The probe will then undergo vibration and atmospheric testing at Ames, and the launch is tentatively scheduled for May. The launch will take place from Wallops Flight Facility in Virginia. The probe will land in the Atlantic Ocean, where it will be retrieved for analysis of the stored data.