

## **THE HUYGENS RADAR ALTIMETER: ANALYSIS OF TEST FLIGHTS**

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The Huygens Probe will make a 2.5 hour parachute descent to Titan's surface in 2004 from an altitude of about 170km. The probe's operation is fully autonomous with experiment operations triggered at predetermined altitudes, which are measured by two redundant Ku-band Frequency Modulated Continuous Wave (FMCW) radar altimeters. The measured altitude, and the automatic gain control (AGC) level, a crude measure of signal strength, of the radars are reported in the probe housekeeping data. There is also the possibility of retrieving scientific data from the radar signals via the digital signal processor in the Huygens Atmospheric Structure Instrument (HASI). This may allow recovery of a crude echo shape from the downconverted signal and thus provide information on the altitude distribution or roughness within the instrument footprint (4 degrees half-angle). A model of the instrument was flown on several helicopter flights in the Tucson area (Arizona, Southwestern USA) and the data recorded as an audio signal on digital audio tape, with simultaneous GPS, attitude and downlooking video. The data are presently being analysed, and are being compared with digital elevation models and satellite remote-sensing data including contemporaneous ground radar reflectivity measured by the Precipitation Radar on the TRMM satellite at the same frequency and incidence angle. Example data from the altimeters and the comparison datasets will be presented at the meeting.