

HASI ACCELEROMETER KALMAN BASED ALTITUDE RECONSTRUCTION OF HUYGENS DESCENT PHASE

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This work presents the results of a new reconstruction effort for the determination of Huygens altitude profile during the descent phase, in which the probe was successfully parachuted from an altitude of around 160 kilometers to ground. This work is based on Kalman filtering and relies mainly on reverse HASI Servo Accelerometer integration from impact up to start of the descent phase. In order to contain altitude uncertainties related to direct double integration, probe motion is propagated through state equations, which model probe dynamics and is corrected with both accelerometer data and PPI (Pressure Profile Instrument) total pressure measurements, which contain the possible drift in descent velocity.

Comparison of result with PPI derived altitude and RADAR altitude profiles is presented as well as a confrontation of uncertainties related with pressure based and accelerometer based reconstruction strategies.