

# TITAN'S NEW POLE: IMPLICATIONS FOR THE HUYGENS PROBE IMPACT COORDINATES

**B. KAZEMINEJAD<sup>1</sup>, D. H. ATKINSON<sup>2</sup>, and J.-P. LEBRETON<sup>1</sup>**

<sup>1</sup> *European Space Agency, Keplerlaan 1, 2200 AZ Noordwijk, The Netherlands*

<sup>2</sup> *Dep. of Electrical and Comp. Eng., Univ. of Idaho, Moscow, ID 83844-1023, USA*

e-mail: *Bobby.Kazeminejad@esa.int*

## ABSTRACT

The European Space Agency's Huygens probe separated from the NASA Cassini spacecraft on 25 December 2004, after having been attached for a 7-year interplanetary journey and three orbits around Saturn. The probe reached the predefined NASA/ESA interface point on 14 January 2005 at 09:05:52.523 (UTC) and performed a successful entry and descent sequence. The probe softly impacted on Titan's surface on the same day at 11:38:10.77 (UTC) with a speed of about 4.54 m/s. The official probe entry and descent phase reconstruction based on the estimated initial state vector provided by the Cassini Navigation team at JPL, the probe housekeeping data, and measurements from the scientific payload was performed by the Huygens Descent Trajectory Working Group (DTWG) and is published in Kazeminejad et al. (1997).

First a brief summary of the DTWG trajectory reconstruction results is presented and compared to other published reconstruction efforts.

Then the impact of the recently updated and published Titan pole coordinates on both the entry and the descent trajectory is analysed and presented: the main impact is a southward drift of about 0.3 degree. No major impact in zonal direction is found (i.e., less than 0.01 deg).

The new planet pole coordinates also provide a new estimation of the probe impact coordinates, 10.57 deg S and 167.68 deg W. A comparison of these coordinates to corresponding values that stem from estimations of reconstruction efforts based on visual and radar images of the Cassini instrument suite (C. Sotin, private communication) show excellent agreement of the two independently derived impact coordinates.