

## VLBI Tracking of the Huygens Probe in the Atmosphere of Titan

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We present results of the assessment study of VLBI (Very Long Baseline Interferometry) observations of the Huygens Probe during the Probe's descent to the surface of Titan. The aim of the study was to assess feasibility of a direct detection and receipt of the S-band radio signal from the Probe during the descent to the Titan surface. Such the direct receipt by Earth-based tracking stations was not foreseen by the original mission scenario but proved to be possible owing to the recent developments of the radio astronomical, particularly VLBI techniques. We analyze power budget of the radio link "Huygens ↔ Earth", the potential accuracy of the VLBI determination of the Probe's coordinates in the atmosphere of Titan and some scientific applications of these measurements. We also discuss prospects of VLBI tracking technique of future deep space missions using the next generation Earth-based radio telescopes, in particular the Square Kilometre Array (SKA).