



## **The Huygens Titan probe Doppler Wind Experiment: recent progress**

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The Huygens Doppler Wind Experiment was performed to derive a profile of Titan's zonal winds at heights from about 144 km down to the surface. The carrier frequency of the ultra-stable Huygens radio signal at 2040 MHz was monitored during the descent at the Green Bank Telescope in West Virginia and the Parkes Radio Telescope in Australia. The horizontal drift of the Huygens probe was found to be predominantly eastward for most of the atmospheric descent, providing the first in situ confirmation of prograde super-rotational zonal winds on Titan. A region of strong vertical shear reversal was discovered within the lower stratosphere. Winds near the surface were weak, but display a characteristic height dependence that implies the existence of a planetary boundary layer. Improvements to the preliminary results published in Bird et al. [Nature 434, 800, 2005] include: reprocessing of the original data to increase the time resolution; construction of a highly accurate analytical approximation; first-order correction for the wind-lag effect; calculation of characteristic parameters (e.g., Richardson Number) for a meteorological interpretation of the atmospheric circulation; detailed analysis of possible radio propagation effects. Each of these issues and

the current status of the continued analysis will be described in this talk.