



## Oscillation of Venus' upper atmosphere

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Little is known about the variability of Venus' upper atmosphere. Here we report discovery of a large ( $\sim \pm 30\text{-}50\%$ ) density oscillation at a period near 9 days that is derived from radar tracking of the Magellan spacecraft between 15 September 1992 and 24 May 1993. The wave is presumed to originate in lower atmosphere regions and to propagate upwards. The density oscillation occurs mainly between dusk and midnight, suggesting that local time differences in forcing, dissipation and mean wind filtering are affecting the wave's accessibility to the upper atmosphere. Dissipation of the 9-day wave is likely to contribute significantly to super-rotation of Venus' thermosphere. Instruments on the Venus Express spacecraft, now in orbit around Venus, have the opportunity to further elucidate the 9-day wave and understand its role in the dynamics of Venus' upper atmosphere.