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## Global-scale tidal variability during the PSMOS campaign of June–August 1999: interaction with planetary waves

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### Abstract

During the PSMOS *Global-scale tidal variability* experiment campaign of June 1–August 31, 1999, a network of radars made measurements of winds, waves and tides in the mesosphere/lower-thermosphere region over a wide range of latitudes. Clear evidence was found that fluctuations in tidal amplitudes occur on a global scale in both hemispheres, and that at least some of these fluctuations are periodic in nature. Modulation of the amplitude of the 12 h tide was particularly evident at periods of 10 and 16 days, suggesting a non-linear interaction with planetary waves of those periods to be responsible. In selected cases, the secondary waves predicted from non-linear theory could be identified and their zonal wave numbers determined. In some, but not all, cases the longitudinal structure of the secondary waves supports the theory of planetary-wave/tidal interaction being responsible for the observed tidal modulation. It was noted also that beating between a 12.4-lunar and the solar tide could produce a near 16-day modulation of the 12 h tide amplitude that is frequently observed in late summer.

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