



Atmospheric Internal Waves Characteristics found from CHAMP and FORMOSAT3 Radio Occultation Amplitude and Phase Data

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Atmospheric internal waves (AIW) have a key role in the atmospheric circulation and in climatic changes. We introduce a method to locate AIW based on simultaneous observations of the amplitude and phase variations in the radio occultation (RO) signal. This new technique was applied to measurements provided during CHAMP and FORMOSAT3 GPS RO missions. We demonstrate that the amplitude and phase variations of RO signal can be considered as a radio-holographic image of wave structures in the atmosphere. For internal gravity waves (GW) we show that the GW dispersion and polarization relationships allow one to estimate the vertical profile of the horizontal wind perturbations, its gradient and the GW intrinsic phase speed. The geographical distribution of the potential and kinetic energy of GW has been obtained with a global coverage. In general case, when the origin and type of internal waves are not known, the height dependence of the vertical gradient of refractivity can be applied for monitoring the seasonal and geographical distributions of wave activity at different levels in the atmosphere.