

RECENT ADVANCES IN GLOBAL WAVE ACTIVITY ANALYSIS FROM LONG-TERM GPS RO DATA

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We present an overview of recent developments regarding long-term global atmospheric wave activity analysis and observations in the lower and middle atmosphere from 6 years of GPS RO observations with CHAMP, SAC-C and GRACE LEOs. General and specific features observed during these years, as the monthly, seasonal, interannual and quasibiennial variability with latitude, longitude and altitude are summarized. Possible limitations and distortions to be expected from these analyses are pointed out. In particular, the alternative calculation of potential energy and mean potential energy from temperature, potential temperature or refractivity, choosing different averaging criteria and band-pass filtering cutoffs is considered. A discussion about expected restrictions or distortions imposed by the relative geometry of wave phase surfaces, lines of sight and of tangent points during each occultation is given. The range of waves that may be detected, as it is the case during mountain forcing, geostrophic adjustment or deep convection, with the consequent reduction of variance calculation is then analyzed. Waves can be better resolved when the fronts are nearly horizontal or when the angle between the occultation line of sight and the horizontal component of the wave vector approaches 90 degrees. We show geometrical relations in terms of the relative orientation between waves and sounding, so as to appropriately interpret wavelengths extracted from the acquired data.