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Observations of quasi-periodic hiss emissions by the ICE and IMSC wave instruments on the Demeter satellite

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An overview of ELF/VLF discrete emissions observed by the DEMETER satellite at latitudes below $\sim 60^{\circ}$ is presented, including natural whistlers arising from lightning discharges, triggered VLF emissions, chorus, periodic and quasi-periodic (QP) hiss emissions. The main attention is paid to QP emissions observed over frequency ranges extending from ~ 400 Hz up to ~ 20 kHz. Several events are displayed to illustrate the different spectral forms (frequency range, modulation frequency, regularity of periodicity, rising structure, total duration...) that are observed and the diurnal and latitudinal variations. The emphasis is put on some unusual QP's occurring at equatorial latitudes and very low L values (L ~ 1.08 -1.2) and consisting of a combination of two rising tone structures observed simultaneously, the first in the frequency range 400-900 Hz and characterized by a modulation period of ~ 10 s, the latter from ~ 900 Hz up to 1.7 kHz, less intense and with a longer modulation period ~ 35 s. The observations are discussed from the viewpoint of sources of modulation and in relation with the main generation mechanisms proposed so far.