

Monochromatic whistler waves at 8 Hz observed by Kaguya above the terminator of the Moon

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Magnetic fluctuations around the moon are characterized with 2 major categories: (1) large amplitude monochromatic waves of 0.01 Hz and (2) monochromatic or non-monochromatic whistler waves, both observed on the dayside surface of the moon or above the terminator. Their generation is associated with (1) the solar wind ions or (2) electrons, respectively, reflected at the surface of the moon or the local crustal magnetic field. The monochromatic whistler waves are found at 1-2 Hz with left-handed polarization due to the Doppler shift caused by the solar wind flow. The frequency range is determined by the group velocity of the whistler waves that can overcome the solar wind speed.

Differently from the previously known characteristics, a new type of monochromatic waves was found at 8 Hz in the magnetic field data obtained by MAP/LMAG onboard Kaguya. They concentrated above the terminator. They propagated in the direction of the background magnetic field and showed right-hand polarization. They are thought to be whistler waves propagating downstream, and the frequency was up-shifted due to the Doppler shift.

Keywords: moon, SELENE, KAGUYA, MAP/LMAG, whistler wave, solar wind