KAGUYA/LRS observations of man-made radio emissions

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The LRS radio and plasma wave instrument on the KAGUYA spacecraft, launched on September 14, 2007, has detected short-wave radio transmissions from broadcast stations on Earth. We describe here some of the earliest observations taken shortly after launch. The LRS covers a wide frequency range including the shortwave radio band from 0.02 to 30 MHz. At frequencies above the maximum electron plasma frequency, radio waves of man-made are free to escape into space. Below this frequency, terrestrial radio waves are generally trapped and cannot escape into space. With respect diurnal variations, fmax is highest at the equator at mid day, reaching 5-6 MHz, and lowest just before local sunrise, about 1-2 MHz. There is some difference between spectrum on 30 October and 06 November below about 6 MHz which can be attribute to effects of the ionosphere. During the interval around 21UT, corresponding to the most intense emissions of the day, the land masses containing the majority of Earth's population, including the Indian subcontinent, Asia, Australia, the middle east Africa, and part of Europe were in view. This fact has a good agreement with the previous observations obtained by Wind/WAVES [Kaiser et al., 1996]. During opposite side, when North and South America in view, the 6 and 7 MHz bands were still quite active.