

MIS014-P03

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Variations in the ionospheric D-region during a total solar eclipse on Jul. 2009 with the LF standard wave observation

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The low frequency (LF) standard radio wave observation has been made during a total solar eclipse on Jul. 22 2009. The LF wave receivers have been installed at the Rikubetsu and Zao observatories in Japan and Tainan Municipal Cingcao Elementary School in Taiwan, and regularly measures several standard radio signals. During the solar eclipse, significant phase variations in the standard radio waves which are transmitted from the Japanese JJY (40 and 60 kHz) and the Chinese BPC (68.5kHz) are identified. Maximum phase change occurred 2-7 minutes after the totality. It is also found that the time delay depends on the radio wave frequency: larger time delay was found in the higher frequency. This is qualitatively interpreted by a height dependence of electron recombination rates in the D-region under an assumption that the radio wave with higher frequency reflects at higher altitude where the electron recombination rate becomes small due to low ambient atmospheric density.