

An electron number density estimated from the Geotail spacecraft potential

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We investigated the relation between Geotail spacecraft potential and electron number density derived from the plasma waves in the solar wind and most of the region of the magnetosphere, and obtained the empirical formula shown the relation between them. The empirical formula is effective in the range of electron number density from 0.001 /cc to 50 /cc, except in the plasmasphere. We compared the electron number density obtained by the empirical formula with the density obtained by the plasma wave and the plasma particle measurement. In the lobe region, the density by the plasma wave has differed from that by the empirical formula. Using the difference of the density, we can examine if the plasma wave lower cut-off frequency indicates the local electron density near the spacecraft or not.