

## Effect of electron temperature on electron density inferred from Geotail spacecraft potential

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We have investigated the correlation between the Geotail spacecraft potential and the electron density derived from the plasma waves in the solar wind and almost all the regions of the magnetosphere, except for the high-density plasmasphere, and obtained an empirical formula to show their relation. We compared the electron density obtained by the empirical formula ( $N_{s/c}$ ) with that given by the characteristic frequency of the plasma waves ( $N_{wave}$ ) and the plasma particle measurements ( $N_{LEP}$ ). In the distant tail region the densities obtained by three methods are about the same value. However, in the near tail region  $N_{s/c}$  is larger than  $N_{wave}$  and  $N_{LEP}$ . In this study we examine why  $N_{s/c}$  is overestimated as compared with the density given by two other methods in the near tail region.