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ポスター 1 : 11/24 PM1/PM2 (13:15-18:15)

プロトンの等方的降りこみは磁気圏プロトンの等方的分布と対応するのか?

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Does isotropic proton precipitation correspond to an isotropic distribution of magnetospheric protons?

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It is not clear from previous low-altitude observations of energetic particle fluxes whether the magnetospheric plasma is also isotropic on the field line of isotropic precipitation. In this study, we have distinguished the low-latitude boundaries of the loss cone filling and the isotropic distribution of energetic protons in an energy range of 10-180 keV/q using middle-altitude off-equatorial observations (3-5 Re geocentric distances) from the Arase satellite. The isotropic distribution boundary is defined by the ratio of proton fluxes at pitch angles of 0 – 45 deg and 45 – 90 deg for the northern hemisphere. The latitude of the isotropic distribution boundary has an energy dependence such that higher energy protons became isotropic at lower latitudes, implying isotropization of protons by the magnetic field line curvature. Around the isotropic distribution boundary, the downgoing loss cone (within 5 deg from the ambient magnetic field) was filled, while the corresponding upgoing loss cone was unfilled due to atmospheric loss. The low-latitude boundary of the loss cone filling was not always at the same latitude as the isotropic distribution boundary, and the loss cone filling tended to start at ~0.1 – 0.4 deg lower latitude from the isotropic distribution boundary. This suggests that the magnetic field curvature required to isotropize the magnetospheric proton distribution is greater than that required for isotropic precipitation.