

新たなプロトン放射線帯モデルに基づくあけぼの太陽電池劣化とプロトン被ばく量の関係
Accumulated energetic protons and degradation of Akebono solar cells from a new model of trapped protons

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Output current of silicon solar cells of Akebono satellite orbiting in the inner magnetosphere decreased from 13 A in 1989 to about 7 A in 2009, due to accumulated damage by energetic protons. We worked on modelling of the L-shell distribution of trapped energetic protons which provides best-fit for the degradation of solar cells before 1996, where the correlation is clearly seen. We found that the modeling gives narrower distribution than given by the AP8 and, even, latest AP9 models, but is more consistent with the CRRES quiet model based on the observation before November 1991. Based on our model derived from observations before 1996, we assume a steady state of the proton radiation belt and calculate the integrated proton flux along the satellite orbit up to 2009. In this report, we present the relationship between the integrated proton flux and the degradation of solar cells for long years.

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