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Discussions on the Features of Energetic Electron Distribution in the Bottom Region of the Earth's Outer Radiation Belt

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The China-Brazil Earth Resource Satellite (CBERS-1 and 2) were launched respectively in 1999 and 2003. On board of the satellites is an energetic particle detector to monitor continuously the radiation environment of energetic electrons (0.5Mev to 2Mev and higher) and protons (5-30 and 30-60Mev) inside the satellite cabinet. In the past five years, a large amount of data was accumulated, analyzed and compared with other observations of satellites with similar orbits and existing models such as AP-8 and AE-8. It is shown that the environment of the energetic particles inside the satellite cabin is exactly the same with that outside, at least for the above energy spectral range. The satellites are polar orbited (solar synchronous) and at an altitude of around 780 km so it covers the bottom region of the earth's outer radiation belts and the South Atlantic Anomaly area of the inner radiation belt. The global energetic electron distribution at the orbit height can be easily obtained by mapping the measured electron fluxes to the earth's surface. In this paper, the observational results are introduced in detail, including the background distribution under quiet conditions and their variations during solar proton events. The results are also compared with the observation of energetic electrons of Chinese Shenzhou-2 with a dip angle of 42 degree at a height of 420km. The emphasis of this paper is put on the discussion of certain features of the distribution, such as the flux asymmetry between southern and northern hemispheres and inhomogeneous distribution along the geomagnetic latitudes of +/- 60 degree. Considering the real geomagnetic field configurations, losses of the energetic electron in the earth's atmosphere and the distribution of electron equatorial pitch angle, a model is put forward to explain these features.