



Trapping and Loss of Radiation Belt Protons from Low-altitude Satellites Observations

Chunqin Wang

National Space Science Center (NSSC), Beijing, China (wcq@nssc.ac.cn)

Research of protons trap and loss has important significance for people to further understand the response to disturbance of the radiation belt and to develop radiation belt model applicable to space weather service. We use protons observations from FY-1 satellites and NOAA satellites to study trapping and loss of the inner proton radiation belt at low altitudes. The proton data sets have wide coverage of energy from 3MeV to 300MeV and pitch-angles which allowed to make the detail analysis and examining of the two types variations. We focused on four cases on Apr 2000, Mar 2001, Oct and Nov 2003 associated with strong storms and different flux level of solar energy protons. The four cases presented in this paper displayed some new characteristics such as the follows: Proton trapping can occur at various locations between $L=1.75$ and $L=3$ with upper limit energy less than 16MeV. It was notable that the peak intensity of trapping protons below 10MeV can exceed central intensity of SAA greatly in cases of Apr 2000 and Mar 2001 especially. Protons loss occurred mainly in 3MeV to 100MeV at $L>2$. In the case of Nov 2003 loss even further to $L\sim 1.75$ and have effect on >100 MeV protons. No loss phenomena appeared below 10MeV just only in the case of Oct 2003. According these new phenomena, We also discussed the possible source and mechanisms.