Geophysical Research Abstracts
Vol. 18, EGU2016-12542, 2016
EGU General Assembly 2016

A new way to estimate the solar wind geoefficiency and its impact on the radiation belts

Sandrine Rochel Grimald, Daniel Boscher, and Rémi Benacquista
Onera, DESP, Toulouse, France (sandrine.rochel@onera.fr)

A magnetosphere is an isolated volume dropped inside the solar wind. It is in equilibrium in the solar wind. If the solar wind parameters change, then, the magnetospheric balance is upset. Moreover, the magnetosphere is not a solar-wind-proof bulkhead. Using several processes, particles and energy from the solar wind can go inside, disturbing the magnetosphere and being responsible of variation of currents and generation of waves. Those phenomena allow absorbing the energy overflow and the come back to the equilibrium. Nevertheless, if the phenomenon is geoefficient, it also impacts the inner magnetosphere populations, and in particular the radiation belts particle flux. The purpose of this work is to understand the solar wind main structures (CMEs and CIRs) impact in the terrestrial magnetosphere. The existing magnetic indices allow estimating how much the system is disturbed at a given time, but they do not allow estimating how long the disturbance modify the magnetosphere. In this paper, we use the Am index to define a new parameter allowing estimating the energy level in the magnetosphere. Using this parameter, we will first present a comparative study of the impact of the CIRs and of the CMEs on the magnetosphere. This study will highlight the role of the multiple CMEs events to fill the magnetosphere energy level. Then, the radiation belts will be analysed from this new point of view in order to understand their role as energy tanks.