Why IMF Bz>0 doesn't produce MeV electrons in the outer radiation belt during the storm recovery phase?

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It is well known that some magnetic storms cause a large enhancement of MeV electron in the outer radiation belt during the storm recovery phase. We have investigated the solar wind parameters and found that the IMF Bz has an important role in producing such large increase in the intensity of MeV electrons. We selected a case in which IMF Bz was pointing northward throughout storm recovery phase. We have identified that no particle injection took place in the heart of outer radiation zone and very little ULF activity was observed by the ground based magnetometer. From these results we like to conclude that no efficient acceleration takes place during the northward IMF situation.

It is well known that some magnetic storms cause a large enhancement of MeV electron in the outer radiation belt during the storm recovery phase. We have investigated the solar wind parameters and found that the IMF Bz has an important role in producing such large increase in the intensity of MeV electrons. When the IMF is pointing southward during the storm recovery phase, a large enhancement of the MeV electrons takes place. In that case we identified a source population of electrons with energies of ten to hundred eV has been transported into the heart of outer radiation zone due to the substorm activities. We also have identified that ULF wave activity increases very much in such conditions. Hence, we have proposed a scenario that MeV electrons are produced with an internal acceleration of seed electrons in the outer radiation zone during the storm recovery phase. To verify our model, we selected a case in which IMF Bz was pointing northward throughout storm recovery phase. We have identified that no particle injection took place in the heart of outer radiation zone and very little ULF activity was observed by the ground based magnetometer. These observations look very much consistent with our model.