Relativistic Electron flux decrease at Geostationary orbit during Magnetic Cloud events of 2005 and their relationship to Satellite health Parameters

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There has been considerable interest in the relativistic electron variations at geostationary orbit. We have been studying the variations in relativistic electron flux at these altitudes during the magnetic cloud events of 2005, tracing the cause right form the Sun through Interplanetary medium through L1 Point at 0.01 AU right into Geomagnetosphere. The recognition that variations in relativistic electrons at Geostationary orbit was modulated by Solar Wind conditions can be traced back to the work of Paulikas and Blake [1976] and an association has also been made with high speed Solar Wind events by Baker et.al.,[1994] and Blake et.al.,[1997]. Gordon Rostoker et.al, [1998] suggested that the drop in the relativistic electron flux is related to the power in the ULF Pulsations.

Based on our study of these Magnetic Cloud Events with respect to different Solar, Interplanetary and Terrestrial Parameters, we classified them into two distinct Categories. One in which the relativistic Electron flux at Geostationary Orbit decreases around Magnetic Cloud event and then rises by orders of Magnitude. The other in which the drop is observed but the rise is by a factor of 1 to 10 only. It has been shown by Baker et.al, [1987], these relativistic Electrons are linked to Deep Dielectric Charging affects on Satellites. From our present study we are able to categorize Magnetic Clouds into 1) Events which affects Satellite health and 2) Events which do not affect Satellite health.