

Science and Engineering for Near-Earth Space Research

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The area around our planet starting from 70 km altitude out to 10 Earth radii is known as the near-Earth space environment. This area is not only home to fascinating physical phenomena but is also of strategic and economic importance because it hosts billions of dollars of spacecraft assets. These spacecraft are vital for communication, global positioning, and military applications. Energetic particles in near-Earth space are damaging to satellite electronics and reduce effective lifetimes of spacecraft. Furthermore, large increases in energetic particle fluxes can potentially destroy a majority of valuable low Earth orbit satellites. Protecting satellite assets and prolonging lifetimes is thus a key economic and strategic issue. In this presentation we examine mitigation of harmful radiation in the near Earth space environment using low frequency electromagnetic waves. The focus is on the engineering and experimental challenges in such research.

Dr. Golkowski received his Ph.D. in the area of electrical engineering from Stanford University in January 2009. His dissertation was entitled "Magnetospheric Wave-injection by Modulated Heating of the Auroral Electrojet". His doctoral research was performed under Prof. Umran Inan of the VLF Group at Stanford, and presently continues with his work. He is also a consultant to Super Pulse, Ithaca, NY.