

PROTECTION OF COMMUNICATION SYSTEMS FROM SOLAR FLARES

GAURAV JINDAL (05BEC069),MAYANK TANEJA (05BEC107)

VIDYA SAGAR (05BEC110)

Address: B. Tech, ECE-3rd year,
Vellore institute of technology,University
Vellore-632014,
Tamil Nadu,
India

Abstract: This paper proposes some ideas for protection of communication systems from solar flares. Solar flares, known as coronal mass ejections, occur when the magnetic energy built in the solar atmosphere is suddenly released carrying with them many protons and electrons which reach the Earth's magnetosphere. Solar flares erupting on the sun's surface pose a threat to electric utilities, high-frequency radio communications, and satellite navigation systems. A possible way to protect this damage is to prevent it with the help of forecasting tools available today. We measure the solar interplanetary magnetic field and determine probable areas and timing of solar flares. Onboard computer models can generate forecasts of solar plasma wind conditions and radiation flux affecting near-earth space environment and interplanetary space. Immediate actions like shutting the particular system under threat or making backup can be taken. Another approach is to protect low earth-orbiting satellites from having their onboard electronics ruined by charged particles in solar flares by generation of very low frequency radio waves to flush particles from the radiation belts and dump them into the upper atmosphere. Another problem faced by the satellites is its differential charging (leading to electronic circuitry damage) by the atmosphere charged by the solar flares. To prevent this, the satellites design can be made spherical for even distribution of charge. Further the satellite can be provided with a conducting shield which accumulates the harmful charged particles or the very material of the satellite can be made of a material inert to the charged particles of the solar flares.