

Group 9



Space Weather and Cosmic Rays Impact to Space Mission. Moderator: Yavor Shopov

Participants

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Space Weather Impact to Space Mission.

- 1. Space Weather production of electric discharges and short circuits inside satellites.
- 2. Space Weather production of electric currents in satellite shells.
- 3. Space Weather production of communication interferences.

Space Weather Impact to Space Mission.

- 1. Space Weather production of electric discharges and short circuits inside satellites.
- Mitigation measures: Switching off the electric systems of the satellite. Mainly the satellite computer. Dedicated sensors and a special logic circuit can be developed for this purpose.
- Problems: How to awake the electric systems of the satellite after the end of the space weather event.

Space Weather Impact to Space Mission.

- 2. Space Weather production of inductive electric currents in satellite shells.
- Mitigation measures. To use highly conductive material for satellite shell, which is able to hold high currents.

Space Weather Impact to Space Mission.

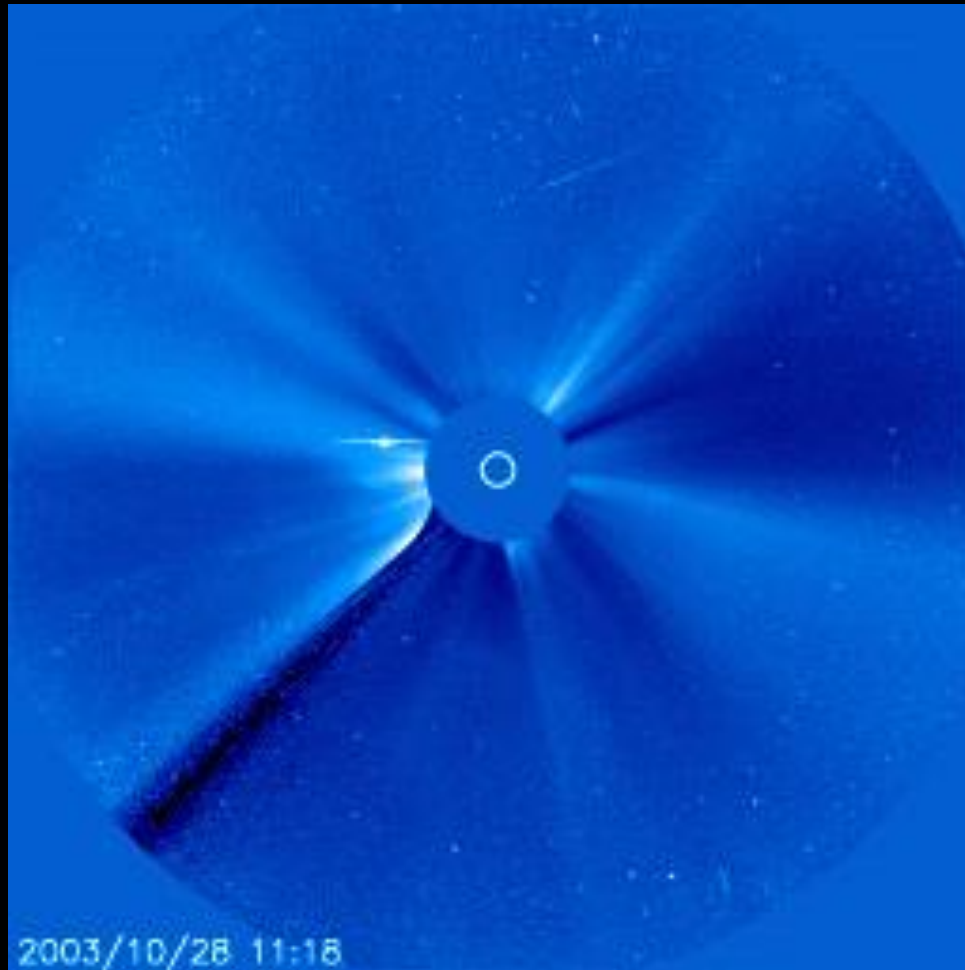
- 3. Space Weather production of communication interferences.
- Mitigation measures: Using of frequencies which are less affected by interferences from space weather, such as radio 1.25 meter (222 MHz) band. It offers several benefits: relatively lower power, long distance propagation, and a longer wavelength that is more robust and less affected by interference.

Cosmic Rays Impact to Space Mission.

- 1. Galactic Cosmic Rays recombination with the electric conductivity centers in semiconductors and turning of them in electric isolators with the time.
- 2. Galactic Cosmic Rays recombination results in communication loss.
- 3. Solar Cosmic Rays production of electric discharges and short circuits inside satellites.

Cosmic Rays Impact to Space Mission.

- 1. Galactic Cosmic Rays recombination with the electric conductivity centers in semiconductors and turning of them into electric isolators with the time. Mitigation measures: Increasing of the size of transistors will prolong their lifetime.
- 2. Galactic Cosmic Rays recombination results in communication loss. Mitigation measures: same as 1
- 3. Solar Cosmic Rays production of electric discharges and short circuits inside satellites. Mitigation measures: Same as for Space weather.



Coronal Mass Ejection with high-energy particles of the solar wind