The Solar Wind-Magnetosphere Interaction

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Earth's magnetic field carves out a hot tenuous cavity known as the magnetosphere in the supersonic solar wind. The magnetosphere provides an opportunity to study many key plasma physics phenomena of great interest, including (1) magnetic reconnection, (2) ion-neutral charge exchange, and (3) charged particle acceleration to relativistic energies. To protect ourselves and our technology, we must learn to predict space weather within the magnetophere. Radiation within the Van Allen radiation belts can cause câncer in humans and disrupt spacecraft operations. Electrical currents can disrupt power line tranmission. Charge particles entering the Earth's atmosphere can prevent radio communication and confuse GPS navigation. Brazil is located directly under the region where radiation penetrates mostly closely to Earth. This talk examines how energy from the Sun enters and flows through the magnetosphere. It highlights the need for more theoretical, simulation, and observational work. Much help is needed!