

Project Details

ROSES ID: NRA-03-OSS-01

Selection Year: 2004

Program Element: Independent Investigation: LWS

Project Title:

Multi-satellite Magnetopause Data Environment

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Project Member(s):

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Summary:

The primary objective of this proposal is to bring online and make web-accessible a database of magnetopause crossings comprised of satellites spanning more than 3 decades and nearly 3 solar cycles. The current proposal is comprised of legacy data sets from the 1960's, 1970's, 1980's, and 1990's, but the design of the database will easily allow the addition of later data sets. Some of our lists of magnetopause crossings exist only as paper copies or on old magnetic tape and could be lost. Some lists are available through the internet but are not widely known or not generally available. We intend to join all of these lists into one interface that will be featured on the main NSSDC Space Physics web page. The final list will contain crossing times, locations and solar wind parameters when available. The new magnetopause database will be joined with a recent web-accessible bow shock database with data from 1974 to 2002, and will inherit all of the latter's capabilities. The multi-satellite magnetopause database proposed here will significantly enhance long term and global science studies. LWS is particularly interested in quantifying the behavior of the physics, dynamics, and behavior of the Sun-Earth system over the 11-year solar cycle and the magnetopause database will provide 3 solar cycles worth of data. Magnetopause global shape and position have been modeled extensively but never with such a complete database. The database can also aid in finding crossings of interest such as those under extreme solar wind conditions. Multi-satellite studies are essential to determine motion of the magnetopause or to resolve waves such as those associated with the Kelvin-Helmholtz instability. The database proposed here will enable these studies. This proposal also responds to two of the science objectives and research focus areas of the Sun-Earth Connection theme of OSS: Goal II SEC RFA 1(c) and Goal I SEC RFA 1(c). The multi-satellite magnetopause database will span more than 3 solar cycles and will facilitate studies within a particular solar cycle as well as across solar cycles. The magnetopause is the outer boundary of the Earth's internal magnetic field and is a critical transition region for transferring solar wind mass, momentum and energy into the magnetosphere and driving space climate.

Publication References:

Summary: "

Reference: Ramona Kessel / Goddard Space Flight Center - Multi-satellite Magnetopause Data Environment