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Report on Thesis "Modeling of the magnetosphere based on multi-year archives of space and ground-based data" by Tsyganenko Nikolai

Nikolai Tsyganenko has developed models of the Earth's magnetosphere based on multi-year archives of space and ground-based data. These models take into account a wide range of data from different sources, including satellite measurements, ground-based magnetometer measurements, and observations of solar wind and other space weather events.

One of Tsyganenko's notable contributions in this area is the development of the Tsyganenko model. This model combines satellite measurements from multi-year satellite data, e.g. Geotail, Polar satellites with ground-based magnetometer data to create a comprehensive model of the Earth's magnetosphere. The Tsyganenko model takes into account a wide range of factors that influence the behavior of the magnetosphere, including the solar wind, the orientation of the Earth's magnetic field, and the presence of electric currents in the magnetosphere. It has been used to study the behavior of the magnetosphere during different phases of the solar cycle and during geomagnetic storms and other space weather events.

Another model developed by Tsyganenko is the Tsyganenko-05 model, which is based on a large dataset of satellite and ground-based measurements spanning several solar cycles. This model takes into account a wide range of factors, including the solar wind, the orientation of the Earth's magnetic field, and the presence of the ring current and other electric currents in the magnetosphere. The Tsyganenko-05 model has been used to study the behavior of the magnetosphere under different conditions, including during geomagnetic storms and other space weather events. Tsyganenko's models based on multi-year archives of data are important for improving our understanding of the long-term behavior of the Earth's magnetosphere and its interaction with the solar wind. They provide a comprehensive view of the complex dynamics of the magnetosphere, and are used by researchers in the field of space physics to study the effects of space weather on Earth and other planets in the solar system.

One of the key features of Tsyganenko's models is their ability to take into account a wide range of data sources. This includes data from multiple satellites, which provides a more complete picture of the magnetosphere than data from a single satellite. In addition, Tsyganenko's models incorporate data from ground-based magnetometers, which provide measurements of the Earth's magnetic field at different locations around the world. This allows for a more comprehensive understanding of the global dynamics of the magnetosphere.

Another important aspect of Tsyganenko's models is their ability to accurately predict the

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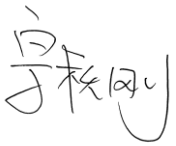
behavior of the magnetosphere under different conditions. This has been critical for understanding the effects of space weather on Earth and for developing strategies to mitigate these effects.

Overall, Tsyganenko's modeling of the magnetosphere based on multi-year archives of data has been critical for advancing our understanding of the Earth's magnetosphere and its interaction with the solar wind. These models continue to be widely used by researchers in the field of space physics to study the effects of space weather on Earth and other planets in the solar system, and to develop strategies to mitigate these effects. I can fairly conclude that the thesis entitled" Modeling of the magnetosphere based on multi-year archives of space and ground-based data" by Tsyganenko Nikolai Alekseevich, deserves to be awarded a Degree of Doctor of physical and mathematical sciences.

Sincerely yours,



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