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## Modeling the Collision of Solar Storm Shock Waves on May 11, 2024

On May 11, 2024, a significant solar storm event occurred, during which the shock waves generated by the solar activity had a profound impact on the space environment. This paper focuses on the collision modeling of these solar storm shock waves. First, we collected multi - source observational data from various space - based and ground - based instruments, including solar telescopes, magnetometers, and particle detectors, to accurately characterize the initial state of the solar storm shock waves. Then, based on the Dynamic Monte Carlo (DMC) method, we established a numerical model to simulate the propagation and collision process of the shock waves. By analyzing the model results, we investigated the physical mechanisms during the shock - wave collision, such as energy transfer, magnetic field reconnection, and particle acceleration. Our findings not only enhance the understanding of the complex physical processes of solar storm shock - wave collisions but also provide valuable references for space weather forecasting and the protection of space - based and ground - based infrastructure.

## **Collaboration(s)**

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