

Author's Accepted Manuscript

Pressure Balance across the Magnetopause during the Solar Wind Event on 5 June 1998

X. Ma, J.Y. Lu, M. Wang



PII: S0032-0633(16)30451-2
DOI: <http://dx.doi.org/10.1016/j.pss.2017.02.014>
Reference: PSS4294

To appear in: *Planetary and Space Science*

Received date: 5 December 2016

Revised date: 31 January 2017

Accepted date: 22 February 2017

Cite this article as: X. Ma, J.Y. Lu and M. Wang, Pressure Balance across the Magnetopause during the Solar Wind Event on 5 June 1998, *Planetary and Space Science*, <http://dx.doi.org/10.1016/j.pss.2017.02.014>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and a review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Pressure Balance across the Magnetopause during the Solar Wind Event on 5 June 1998

X. Ma¹,

Institute of Space Weather, Nanjing University of Information Science & Technology, Nanjing 210044, China

J. Y. Lu^{1,*}

Institute of Space Weather, Nanjing University of Information Science & Technology, Nanjing 210044, China

M. Wang¹,

Institute of Space Weather, Nanjing University of Information Science & Technology, Nanjing 210044, China

Abstract

A three-dimensional adaptive magnetohydrodynamic (MHD) model, SWMF, is used to simulate the interaction between the solar wind and magnetosphere for a particular event on 5 June 1998, and the simulated results of this event is used to investigate the balances of the dynamic, thermal and magnetic pressure along the Sun-Earth line for the different conditions of interplanetary magnetic field (IMF). The conclusions are as follows: (1) outside the magnetopause, the total and thermal pressures are clearly correlated with upstream solar wind dynamic pressure and increase with the solar wind dynamic pressure. In contrast, the magnetic pressure decreases with the increasing intensity of the southward IMF due to the magnetic reconnection and is enhanced with the increasing intensity of the northward IMF due to the magnetic accumulation. It is similar to the variation inside the magnetopause; (2) the solar wind pressure coefficient is larger for the northward IMF than that for the southward IMF, but it has no obvious dependence on the upstream solar wind dynamic pressure; (3) the magnetic field compression ratio just inside the magnetopause is larger and more stable in northward IMF than in southward IMF; and (4) along the Sun-Earth line, the thermal pressure is dominant on the magnetopause in southward IMF, while the magnetic pressure is dominant on the magnetopause in northward IMF. The magnetic reconnection

*Corresponding author: jyly@nuist.edu.cn (J.Y. Lu)

Download English Version:

<https://daneshyari.com/en/article/5488089>

Download Persian Version:

<https://daneshyari.com/article/5488089>

[Daneshyari.com](https://daneshyari.com)