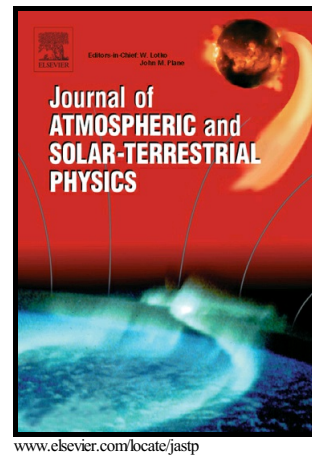


Author's Accepted Manuscript

Use of multivariate relevance vector machines in forecasting multiple geomagnetic indices

T. Andriyas, S. Andriyas



PII: S1364-6826(16)30383-2
DOI: <http://dx.doi.org/10.1016/j.jastp.2016.11.002>
Reference: ATP4512

To appear in: *Journal of Atmospheric and Solar-Terrestrial Physics*

Received date: 25 June 2016
Revised date: 8 November 2016
Accepted date: 11 November 2016

Cite this article as: T. Andriyas and S. Andriyas, Use of multivariate relevance vector machines in forecasting multiple geomagnetic indices, *Journal of Atmospheric and Solar-Terrestrial Physics*, <http://dx.doi.org/10.1016/j.jastp.2016.11.002>

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 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

Use of multivariate relevance vector machines in forecasting multiple geomagnetic indices

T. Andriyas¹ and S. Andriyas²

¹ *DSK Post-Doctoral Fellow, Centre of Material Sciences, Institute of Inter Disciplinary Studies, University of Allahabad.*

² *Water Engineering and Management, School of Engineering and Technology, Asian Institute of Technology, Khlong Luang, Pathumthani 12120, Thailand.*

Abstract

The forecasting ability of Multivariate Relevance Vector Machines (MVRVM), used previously to generate forecasts for the *Dst* index, is extended to forecast the *Dst*, *AL*, and PC indices during the years 1975-2007. Such learning machines are used in forecasting because of their robustness, efficiency, and sparseness. The MVRVM model was trained on solar wind and geomagnetic activity data sampled every hour with activity periods of various intensities, durations, and features. It was found that during the training phase, for a given error threshold, 14.60% of the training data was needed to explain the features of the data. The trained model was then tested on 177 different storm intervals, at various levels of geomagnetic activity, to generate simultaneous forecasts of the three indices at a lead time of one hour (1-h). The focus of the modeling was to assess the forecasts during main storm (MS)

*Corresponding author

Email address: tushar.andriyas@aggiemail.usu.edu ; Phone no.: (T. Andriyas¹ and S. Andriyas²)

Preprint submitted to Journal of Atmospheric and Solar-Terrestrial Physics November 8, 2016

Download English Version:

<https://daneshyari.com/en/article/5487624>

Download Persian Version:

<https://daneshyari.com/article/5487624>

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