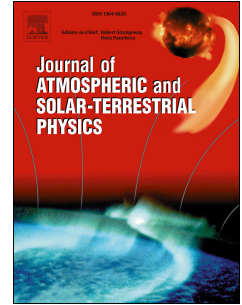


Accepted Manuscript

Ionosonde-based indices for improved representation of solar cycle variation in the International Reference Ionosphere model

Steven Brown, Dieter Bilitza, Erdal Yigıt



PII: S1364-6826(17)30172-4

DOI: [10.1016/j.jastp.2017.08.022](https://doi.org/10.1016/j.jastp.2017.08.022)

Reference: ATP 4669

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

Received Date: 22 March 2017

Revised Date: 24 July 2017

Accepted Date: 16 August 2017

Please cite this article as: Brown, S., Bilitza, D., Yigıt, E., Ionosonde-based indices for improved representation of solar cycle variation in the International Reference Ionosphere model, *Journal of Atmospheric and Solar-Terrestrial Physics* (2017), doi: 10.1016/j.jastp.2017.08.022.

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 proof before it is published in its final 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.

Ionosonde-Based Indices for Improved Representation of Solar Cycle Variation in the International Reference Ionosphere Model

Steven Brown^{a,□}, Dieter Bilitza^{a,b}, Erdal Yiğit^a

^aGeorge Mason University, Department of Physics and Astronomy, Space Weather Laboratory, Fairfax, Virginia, USA

^bNASA Goddard Space Flight Center, USA

Abstract

A new monthly ionospheric index, IG^{NS} , is presented to improve the representation of the solar cycle variation of the ionospheric F2 peak plasma frequency, foF2. IG^{NS} is calculated using a methodology similar to the construction of the "global effective sunspot number", IG, given by Liu et al. (1983) but selects ionosonde observations based on Hemispheres. We incorporated the updated index into the International Reference Ionosphere (IRI) model and compared the foF2 model predictions with global ionospheric observations. We also investigated the influence of the underlying foF2 model on the IG index. IRI has two options for foF2 specification, the CCIR-66 and URSI-88 foF2 models. For the first time, we have calculated IG using URSI-88 and assessed the impact on model predictions. Through a retrospective model-data comparison, results show that the inclusion of the new monthly IG^{NS} index in place of the current 12-month smoothed IG index reduce the foF2 model prediction errors by nearly a factor of two. These results apply to both daytime and nighttime predictions. This is due to an overall improved prediction of foF2 seasonal and solar cycle variations in the different hemispheres.

Keywords: Ionosphere, International Reference Ionosphere, Space Weather,

□Corresponding author

Email addresses: sbrown3@masonlive.gmu.edu (Steven Brown), eyigit@gmu.edu (Steven Brown)

Download English Version:

<https://daneshyari.com/en/article/8139578>

Download Persian Version:

<https://daneshyari.com/article/8139578>

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