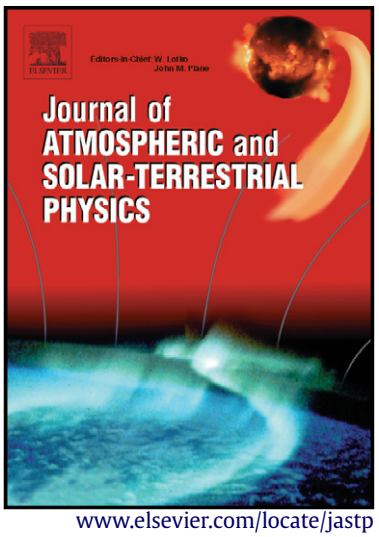
Author's Accepted Manuscript



www.elsevier.com/locate/jastp

Effective subtraction technique at the Irkutsk Incoherent Scatter Radar: Theory and Experiment

O.I. Berngardt, D.S. Kushnarev

PII: S1364-6826(13)00099-0
DOI: http://dx.doi.org/10.1016/j.jastp.2013.03.023
Reference: ATP3813

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

Received date: 1 January 2012
Revised date: 20 March 2013
Accepted date: 26 March 2013

Cite this article as: O.I. Berngardt, D.S. Kushnarev, Effective subtraction technique at the Irkutsk Incoherent Scatter Radar: Theory and Experiment, *Journal of Atmospheric and Solar-Terrestrial Physics,* http://dx.doi.org/10.1016/j.jastp.2013.03.023

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.

ACCEPTED MANUSCRIPT

Effective subtraction technique at the Irkutsk Incoherent Scatter Radar: Theory and Experiment

O.I. Berngardt, D.S. Kushnarev

Institute of Solar-Terrestrial physics, P.O.Box 291, Irkutsk, 664033, Russia

Abstract

We describe a sounding technique that allows us to improve spatial resolution at the Irkutsk Incoherent Scatter Radar (IISR) without loosing spectral resolution. The technique also allows us to decrease temperature estimation errors caused by the Faraday effect. The technique is based on transmitting various duration pulses without any modulation and on subtracting correlation matrices of the received signal grouped by sounding pulse duration. We show theoretically and experimentally that the technique allows us to solve the problem of improving spatial resolution. Accumulation time for the technique is approximately 4 times longer than that for the alternating codes technique with the same spatial resolution.

The number of lags in the correlation function with high spatial resolution does not depend on necessary spatial resolution. In the proposed technique, all the lags are obtained with the same spatial resolution and with the same signal-to-noise ratio. The technique is valid within the quasi-static ionospheric parameter approximation.

Keywords: Incoherent scattering, Spatial resolution, Processing

Email address: berng@iszf.irk.ru (O.I. Berngardt)

Accepted manuscript

Download English Version:

https://daneshyari.com/en/article/8140262

Download Persian Version:

https://daneshyari.com/article/8140262

Daneshyari.com