## **Atmospheric and Space Environments**

Papers Presented at the AIAA SciTech Forum and Exposition 2020

Orlando, Florida, USA 6-10 January 2020

ISBN: 978-1-7138-1078-0

## Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571



a		•			43		•				4	• 4	•
Some	tormat	ICCITAC	inheren	t in	the e	-media	Version	may 9	alen ar	mear II	n thic	nrint	version.
Some	ivi illat	issucs			u	-mcuia	VCI SIUII	11161 7 6	aisu ap	pcai ii		թւաւ	VCI SIUII.

The contents of this work are copyrighted and additional reproduction in whole or in part are expressly prohibited without the prior written permission of the Publisher or copyright holder. The resale of the entire proceeding as received from CURRAN is permitted.

For reprint permission, please contact AIAA's Business Manager, Technical Papers. Contact by phone at 703-264-7500; fax at 703-264-7551 or by mail at 34922 Uwptkig'Xcmg{'Ftkxg.''Uwkg'422, Reston, VA 20191, USA.

## TABLE OF CONTENTS

INSTRUMENTS AND TECHNIQUES	
DEVELOPMENT AND CHARACTERIZATION OF AN ION SOURCE TO SIMULATE SOLAR WIND PLASMA IN A VACUUM CHAMBER	1
AN X-RAY SPECTROSCOPIC APPROACH TO REMOTE SPACE OBJECT POTENTIAL DETERMINATION: EXPERIMENTAL RESULTS	9
PLATE LINES REDUCE LIFETIME OF WAKE VORTICES DURING FINAL APPROACH TO VIENNA AIRPORT	22
ENVIRONMENTS, NATURAL AND MAN-MADE	
ELECTRODYNAMIC COUPLING BETWEEN THE ATMOSPHERIC AND SPACE ENVIRONMENTS AFTER AN EXTREME SPACE WEATHER EVENT	40
PHOTOELECTRON SHEATH NEAR THE LUNAR SURFACE: FULLY KINETIC MODELING AND UNCERTAINTY QUANTIFICATION ANALYSIS	65
FULLY KINETIC PIFE-PIC SIMULATIONS OF PLASMA CHARGING AT LUNAR CRATERS	78
David Lund, Jianxun Zhao, Alexander Lamb, Daoru Han  THE EFFECTS OF MARTIAN AND LUNAR DUST ON SOLAR PANEL EFFICIENCY AND A PROPOSED SOLUTION	89
SPACECRAFT CHARGING, ARCING AND RADIATION DAMAGE	
CONSIDERATION ON VOLTAGE RISING IN SPACECRAFTS DURING FLASHOVER DISCHARGE	102
DIFFERENCE IN THRESHOLD VOLTAGE OF ARC INCEPTION BETWEEN ELECTRON BEAM AND ULTRAVIOLET ENVIRONMENT  Kazuhiro Toyoda, Sayaka Kose, Takaaki Sasaki, Mengu Cho	108
A PROVEN METHOD TO PREVENT SOLAR ARRAY ARCING IN GEO – BULK-CONDUCTIVE COVERGLASSES	114
MAXAR EOR RADIATION TO POWER PREDICTIONS	126

**Author Index**