

Solid Rockets

Papers Presented at the AIAA Propulsion and Energy
Forum 2019

Indianapolis, Indiana, USA
19 - 22 August 2019

ISBN: 978-1-7138-0125-2

Printed from e-media with permission by:

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



Some format issues inherent in the e-media version may also appear in this print version.

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 Uwytkug'Xcmg{'Ftkxg.'Uwky'422, Reston, VA 20191, USA.

TABLE OF CONTENTS

INNOVATIVE ARIANEGROUP CONTROLLABLE SOLID PROPULSION TECHNOLOGIES	1
<i>Pascal Caubet, Michel Berdoyes</i>	
HOT GAS NOZZLE-VALVE ASSEMBLY, CONTROL METHOD FOR CONTINUOUSLY OPERATING DIVERT-, ATTITUDE CONTROL SYSTEMS	11
<i>Karl W. Naumann, Norman Hopfe</i>	
EXPERIMENTAL, NUMERICAL INVESTIGATION OF A JET VANE OF THRUST VECTOR CONTROL SYSTEM	26
<i>Burak Sögütçü, Bülent Sümer</i>	
DYNAMIC CHARACTERISTICS OF THE AEROSPIKE-SHAPED PINTLE NOZZLE FOR VARIABLE THRUST	36
<i>Dong Sung Ha, Jeong Jin Kim, Hong Jip Kim</i>	
DEVELOPMENT OF THE MULTIFACTORIAL COMPUTATIONAL MODELS OF THE SOLID PROPELLANTS COMBUSTION BY MEANS OF DATA SCIENCE METHODS –PHASE III	46
<i>Victor S. Abrukov, Alexander N. Lukin, Nichith C, Charlie Oommen, Mikhail V. Kiselev, Darya A. Anufrieva, VR Sanal Kumar</i>	
FULLY TRANSIENT CONJUGATE ANALYSIS OF SILICA-PHENOLIC CHARRING ABLATION COUPLED WITH INTERIOR BALLISTICS	54
<i>Cetin O. Alanyalioglu, Yusuf Özyörük</i>	
NUMERICAL SIMULATIONS OF AIR INCLUSIONS USING ROBOOST SIMULATION TOOL	81
<i>Fabrizio Ponti, Stefano Mini, Adriano Annovazzi</i>	
A SIMPLIFIED APPROACH TO PREDICT FRIEDMAN CURL EFFECT IN A SOLID ROCKET MOTOR USING ROBOOST SIMULATION TOOL	94
<i>Fabrizio Ponti, Stefano Mini, Adriano Annovazzi</i>	
QUASI-ONE DIMENSIONAL MODEL OF PRESSURE OSCILLATIONS IN AFT-FINOCYL SOLID ROCKET MOTORS: A CRITICAL EVALUATION OF ALTERNATIVE CLOSURE SUB-MODELS, CALIBRATIONS	105
<i>Marco Grossi, Mariasole Laureti, Bernardo Favini</i>	
COMPARATIVE ANALYSIS, JUSTIFICATION OF OPTIMAL ROCKET MOTOR SELECTION IN NASA USLI BY APPLYING NEWTON’S SECOND LAW TO A VARIABLE MASS BODY	117
<i>Brandon Roberts, Ashwyn Sam, John Brand, Trevor S. Elliott</i>	
THE NUMERICAL SIMULATION ON THE FLOW FIELD INSTABILITY FEATURES OF A VARIABLE THRUST SOLID ROCKET MOTOR	127
<i>Yinxin Li, Xin Sui, Weijie Hou, Junbo Wang</i>	
0D UNSTEADY - 1D QUASI-STATIONARY INTERNAL BALLISTIC COUPLING FOR ROBOOST SIMULATION TOOL	139
<i>Fabrizio Ponti, Nabil Souhair, Stefano Mini, Adriano Annovazzi</i>	
COMBUSTION OF ALUMINIZED SOLID PROPELLANTS WITH BIMODAL OXIDIZER PARTICLE SIZE DISTRIBUTION	159
<i>Bachar Elzein, Jacques Xing, Olivier Jobin, Etienne Robert</i>	
EXAMINATION OF FLOW FIELD INSIDE GRAIN PORT, GRAIN REGRESSION CHARACTERISTICS OF A NOZZLELESS SOLID PROPELLANT ROCKET MOTOR	169
<i>Ali Can Özer, Bülent Sümer, Yusuf Özyörük</i>	
THE OPTIMUM ROCKET NOZZLE EXPANSION RATIO: AN AIR – TO – AIR MISSILE DEMONSTRATION	175
<i>Robert S. Hiers, Robert Knapke</i>	
QUENCH COLLECTION, ARTIFICIAL NEURAL NETWORK PREDICTION OF MICRO, ULTRA-FINE ALUMINUM AGGLOMERATION PHENOMENA IN COMBUSTION OF SOLID ROCKET PROPELLANTS: EXPERIMENTS, MODELING	186
<i>Tejasvi K, Venkateshwara Rao Vemana, Jayaraman K</i>	
Author Index	