28th AIAA International Communications Satellite Systems Conference 2010

(ICSSC 2010)

Anaheim, California, USA
27 – 30 September 2010

ISBN: 978-1-61782-516-3

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 1801 Alexander Bell Drive, Reston, VA 20191, USA.

TABLE OF CONTENTS

Spatially Superposed 16-QAM System with Two Offset-QPSK Signals 1
Masayoshi Tanaka

SNR Estimation for ACM in DVB-RCS Satellite Systems 10
Ayesha Ijaz, Adegbenga Awoseyila, Barry Evans

A New MPE-FEC Decoding Algorithm 27
Chul Seung Kim, Min Hyuk Kim, Tae Doo Park, Ji Won Jung

Satellite's Role in Achieving Communications Interoperability for Emergency Response and Disaster Relief Operations 32
Jim Corry

Analysis of IP Routing Approaches for LEO/MEO Satellite Networks 43
Xiangdong Liu

Evolution of LDACS Protocol to Support Safety Aeronautical Communications by Satellite 50
Hugo Gonzalez Perez, Laurence Clarac, Katia Leconte, Thales Alenia, Laurent Bouscary,

25-kW Bus Platform for Communications Satellites 62
Thomas Hollingsworth, Walter Gelon, Alan Szeto, Anthony Applewhite, Eddy Yee

Performance and Evolution of Stationary Plasma Thruster Electric Propulsion for Large Communications Satellites 72
Ron Corey

Key Issues and Technologies for a Terabit/s Satellite 92
Barry Evans, Paul Thompson

Ground-Based and Onboard-Based Beamforming for Hybrid Terrestrial-Satellite Mobile System 103
Ammar Khan, Muhammad Imran, Barry Evans

Leveraging Digital On-Board Processing to Increase Communications Satellite Flexibility and Effective Capacity 113
Thomas Butash, Joseph Marshall

Mobile Ad Hoc Network Routing Assisted by Satellites 123
Carlos Giraldo Rodriguez, Laurent Franck, André-Luc Beylot, Cédric Baudoin

Satellite Communications for Management of Mass Casualty Incidents: The e-Triage Project 130
Angels Via, Markus Werner, Anton Donner

Improving performance of Map Updates through Satellite Communications in Vehicular Networks 141
Darwin Astudillo, Andre-Luc Beylot, Emmanuel Chaput

Recent Developments in Ka-Band Satellite Antennas for Broadband Communications 149
Michel Forest, Eric Amyotte, Yves Demers

Frequency Scalable Low Profile Broadband Quad Fed Patch Element/Array © 154
TJ Hawkins

A Novel Digitally Polarization Tracking Antenna for Ku-Band Mobile Satellite Communication Systems 162
Yoshinori Suzuki, Fumihiro Yamashita, Kiyoshi Kobayashi, Yozo Takeda

Compact High Performance Reflector Antenna Feeds for Space Application 169
Clency Lee-Yow

Analysis of Turbo Codes for Next Generation DVB-RCS System 175
Taedoo Park, Minhyuk Kim, Chulseong Kim, Jiwon Jung

Content Relevance-Oriented Communication Scheme for Data Transport in Interplanetary Networks 181
Robil Daher, Martin Krohn, Mario Donick

Multilayer IPSec (ML-IPSec) Design for Transport and Application Layer Satellite Performance Enhancing Proxies 191
Haitham Cruickshank, Nasir Bhutta, Martin Moseley, John Ashworth

Quality of Interaction: an Alternative Model for QoS in Deep-Space Communication Networks 198
Robil Daher

Satellite Link Emulation Platform for Aeronautical Application Validation 208
Fabien Garcia, Mathieu Magnaudet, Alain Pirovano

Wireless Ad Hoc Networks Access for Aeronautical Communications 219
Frédéric Besse, Fabien Garcia, Alain Pirovano, José Radzik

Balancing Air and Space Communication Assets 234
Julie Miller

Satellite Jamming Mitigation Using UAV Relays 239
Carmen Cerasoli, James Dimarogonas

Protected SATCOM On-Demand for Mobile Terminals: Waveform and System/Terminal Tradeoffs 253
Mario Blanco
Comparative Analysis of Tropospheric Degradation in Southern England 266
Tareq Alawadi, Ali Savvaris, Spiros Ventouras
Preamble based Adaptive Beamformer for Hybrid Terrestrial-Satellite Mobile System 274
Ammar Khan, Muhammad Imran, Barry Evans
Variable Output Power and Linear L-Band SSPA 285
Shabbir Moochalla, William Taft, Johan Ramirez
Fiber-Like Aircraft Satellite Communications: FAST, an Aerospace Valley project - System Architecture and Protocol Stack Design 292
Jose Radzik
Maximum Internet Capacity to Aircraft 302
Ed Elizondo, Byung Min, Nick LaPrade
Cost Benefit Analysis for "Non-Safety" Satellite Based Aeronautical Services (ESA-CBA) 313
Jean-Marc Gaubert, Rainer Koll, Oliver Lücke
Modeling and Evaluation of an Aeronautical Telemedicine Service via Satellite 340
Laurent Franck, Mohamed Mrabet, Bernard Comet
Study of the Interaction Between the Feed and the Subreflector and its Impact on Antenna Performance 349
Ji-Fu Ma, Peter Simon, Michael Aliamus, Michael Thorburn, Karl Clausing
Architecture, Implementation and Performance of Ground-Based Beam Forming in the DBSD G1 Mobile Satellite System 353
John Walker, Bob Day, Sarah Xie
The IRCBus Communication Protocol Construction Design and Realization for Distributed Control System 382
Pandy Pandy
Climate Satellites with Laser Communication Links 390
Paul Christopher
On Interference Level in Satellite Uplink for Satellite/Terrestrial Integrated Mobile Communication System 405
Amane Miura, Hiroshi Watanabe, Naokazu Hamamoto, Yoshiyuki Fujino, Ryutaro Suzuki
Security Architecture Design for Satellite Aeronautical Data Link Communications 411
nicolas larrieu, Mohamed Ben Mahmoud, Alain Pirovano
Safety Aeronautical Communications by Satellite: Create Or Recycle - S-UMTS and GMR Recycling 422
Hugo Gonzalez Perez, Laurence Clarac, Katia Leconte, Thales Alenia, Laurent Bouscary,
On the Usage of a Dedicated Data Link Layer and Half Duplex Terminals in Satellite Systems for Future Air Traffic Management 431
Mathieu Gineste, Thales Alenia, Hugo Gonzalez
Antenna Pointing Error Effects on Global Capacity for Broadband ACM Systems 443
Xavier Deplancq, Baptiste Palacin, Mickael Menez, Hugo Gonzalez Perez
Design, Integration and Deployment of the TerreStar 18-Meter Reflector 455
Dennis Semler, Ann Tulintseff, Rodney Sorrell, James Marshburn
Global Resource Manager for Mobile Satellite Systems Employing Non-Uniform Frequency Allocations 468
Jeffrey Freedman, Philip Rubin, Adam Eisenman, Eric Halvorsen, Joe Freitag
Evolution in Last Mile Satellite Broadband Access Systems Driven by Market Demands 478
William Hreha, Kathy Shockey
A Smart Temperature Sensor for Storage Battery V-T Control in Satellite Power Supply System 483
Linda Linda
Optimized and Advanced Multi-Mission Communication Satellite System: A Panacea for a Systemic Paradigm Shift Towards Small Standardized and Advanced Multi-Purpose Geostationary Spacecraft for an Active Global Communication Infrastructure to Promote Digital Inclusion in the Global Village 491
Lasisi Lawal
Next-Generation Spacecraft Command & Data Handling System Based on the RAD750 Processor 496
Pablito Yra, Matteo Genna, Sean McMahon, Kevin Kerns, Robert Tiede, Mike Laird, Tom Cronauer
Inter-Component Interference Reduction through Flexible Frequency Reuse in Integrated Mobile Satellite-Terrestrial System 505
Vincent Deslandes
Link Performance of LTE Versus WiMAX for Satellite Mobile Broadband 514
Adegbenga Awoseyila, Barry Evans

Feasibility Evaluation of VPFDM Modem for Polarization-Tracking-Free Ku Broadband Mobile Satellite Communications.....525
Fumihiro Yamashita, Junichi Abe, Hiroki Uchiyama, Yoshinori Suzuki, Katsuya Nakahira, Kiyoshi Kobayashi, Yokosuka-Shi, Yozo Takeda
The Business of Hosted Payloads.....533
Ken Faller, Alfred Tadros
Satellite Frequency Reuse of Complementary Ground Components in an Integrated Satellite and Terrestrial System 543
Hyemi Gam
Author Index