



10TH INTERNATIONAL CONFERENCE ON OPERATIONS RESEARCH

The Tenth edition of the International Conference on Operations Research was the result of the joint work of different groups of the organizing universities and of the institutions supporting it. The conference took place in La Habana at Hotel Habana Riviera, from March 6th to 9th, 2012. The conference was organized by Universidad de La Habana, SAMM-Université Paris1 Panthéon-Sorbonne and Université Paris-Dauphine. It received the sponsorship of Agence Nationale de la Recherche (Fr), Benemérita Universidad Autónoma de Puebla (Mx), Cubana de Aviación (Cu), Oficina del Historiador de la Ciudad (Cu), Los Portales S.A. (Cu), Sociedad Cubana de Matemática y Computación (Sección Investigación Operacional, Cu), Société Française de Statistique (Fr), Société Française de Mathématiques Pures et Appliquées (Fr), Universidad Autónoma de Guerrero (Mx) and Universidad de Las Palmas Gran Canaria (Es). Cubana Airlines offered reduced flight tickets for the participants in the conference.

The conference contained 135 research papers in topics at the interface between Optimization, Statistics, Computing and Mathematical Models for Economics. They were spread in streams of sessions on Algorithms and Related Topics, Economical Models, Multicriteria, Operations Research, Optimization, Partial Differential Equations, Probabilities and Statistics.

The ICOR conference continues to attract researchers from across the traditional themes all around the world. Following the historical trend, the conference once again attracted high quality papers, with the presentation of both theoretical and experimental results. A number of papers considered applications in real life problems. The participants came from North America (Canada, Mexico and United States), Latin America (Argentina, Brazil, Chile, Colombia, Paraguay and Uruguay), Europe (Austria, France, Germany, Great Britain, Italy, Slovenia, Spain, Turkey), Asia (Iran and Japan) and Africa (Algeria and South Africa).

The delivered Plenary Lectures were :

- J.N. Bacro(Fr): Max-stable processes and spatial extremes.
- D. Bakry(Fr): Diffusions and orthogonal polynomials.
- Eyraud-Loisel (Fr): An overview of some financial models using BSDE and FBSDE with enlarged filtrations
- M. Lotz(UK): Complexity in convex optimization and compressed sensing
- Mordukhovich(USA): Variational analysis in Optimization and Operations Research
- J. Puerto (Es): 50 minutes on location/distribution problems and their associated fair allocation schemes.
- J. Ruckmann(UK): Mathematical programs with complementarity constraints: critical point theory.

Main talks provoked the streams of contributions posing nowadays problems. They were delivered by D. Aussel (Fr), B. Cornet (Fr), M. Cottrell (Fr), and J. Daduna (De), M.J. Negreiros(Br),J. Rynkiewicz (Fr) and C. Tammer (De).

A selection of the papers presented at ICOR will be published in a volume of this journal.

The general chair was Sira Allende(Universidad de La Habana) and the program chair was Marie Cottrell (Univerisità Paris 1).

A detailed list of the talks is given below:

CONTRIBUTED AND INVITED CONTRIBUTIONS

Plenary Lectures

MAX-STABLE PROCESSES AND SPATIAL EXTREMES

J.N. Bacro*, and C. Gaetan**

*University of Montpellier II, France. **Universita Ca' Foscari, Venezia, Italy.

DIFFUSIONS AND ORTHOGONAL POLYNOMIALS

Dominique Bakry

Universit_e Paul Sabatier, France,

AN OVERVIEW OF SOME FINANCIAL MODELS USING BSDE AND FBSDE WITH ENLARGED FILTRATIONS

Anne Eyraud-Loisel

Universit_e Lyon 1, France

COMPLEXITY IN CONVEX OPTIMIZATION AND COMPRESSED SENSING

Martin Lotz

University of Edinburgh, UK

VARIATIONAL ANALYSIS IN OPTIMIZATION AND OPERATIONS RESEARCH

Boris Mordukhovich

Wayne State University, USA.

50 MINUTES ON LOCATION/DISTRIBUTION PROBLEMS AND THEIR ASSOCIATED FAIR ALLOCATION SCHEMES

Justo Puerto

Universidad de Sevilla, Spain

MATHEMATICAL PROGRAMS WITH COMPLEMENTARITY CONSTRAINTS: CRITICAL POINT THEORY

Jan Ruckmann

University of Birmingham, UK

Contributed Talks

COMBINING MIXED (POINT INSERTION) DELAUNAY TECHNIQUES FOR QUALITY 3-DIMENSIONAL MESH GENERATION

M. A. Abellòn

University of Holguin, Cuba.

AN APPLICATION OF REGIME-SWITCHING MODELS TO HISTORICAL DATA

J. Alerini, M. Olteanu, and J. Ridgway

SAMM, University Paris I, France.

POSTGRADUATE EDUCATION ON OR: TOWARDS A MULTIDISCIPLINARY APPROACH TO APPLICATIONS

S. M. Allende

Universidad de La Habana, Cuba

TOOLS FOR USING GIS INFORMATION ON ROUTING PROBLEMS

S. Allende* and J. Calderòn**

*Universidad de La Habana, **GEOCUBA, Cuba.

SIMULTANEOUS PICK AND DELIVERY VEHICLE ROUTING PROBLEM INTEGRATED TO A GIS
Sira Allende*, D. Diaz**, and A. Fernández*
*Universidad de La Habana, **GEOCUBA, Cuba.

STEP SOLITON SOLUTIONS OF THE SHALLOW WATER EQUATIONS
A. C. Alvarez*, A. Meril***, and B. Valiño**
*Oceanology Institute, **Universidad de La Habana, Cuba.***IMPA, Brazil.

SOLVING THE BALANCED ACADEMIC CURRICULUM PROBLEM USING THE BEST-WORST ANT SYSTEM
D. Aravena*, J. Rubio Leon**, and M. Bruno Melendez**
*Pontificia Universidad Católica de Valparaíso, **Universidad de Playa Ancha, Chile.

MODELADO DE LA VACUNACIÓN UNIVALENTE Y BIVALENTE DEL DENGUE CON APLICACIÓN DEPENDIENTE DE ANTICUERPOS ADE
O. A. Arce**, A. Muñoz* and J. Betancourt**
*Universidad del Quindío, Colombia. **Universidad Médica de Camagüey-Cuba,

FROM THE VLASOV-MAXWELL-BOLTZMANN SYSTEM TO INCOMPRESSIBLE VISCOUS ELECTRO-MAGNETO-HYDRODYNAMICS
D. Arsenio and L. Saint-Raymond

A GLOBAL OPTIMIZATION ALGORITHM FOR THE NONLINEAR SUM OF RATIOS PROBLEM
A. M. Ashtiani and P. A. V. Ferreira
State University of Campinas, Brazil.

MODELIZATION OF ELECTRICITY MARKETS: FROM SIMPLE MODELS TO MORE REALISTIC ONES
D. Aussel*, M. Cervinka**, and M. Marechal*
*University of Perpignan, France. **Czech Academy of Sciences, Czech Republic

THERE IS NO VARIATIONAL CHARACTERIZATION OF CYCLES IN THE METHOD OF PERIODIC PROJECTIONS
J.B. Baillon*, P. L. Combettes**, and R. Cominetti***
*SAMM, Université Paris 1, **UPMC Université Paris 06, France. ***Universidad de Chile, Chile.

INTERACTIVE MULTIOBJECTIVE TABU/SCATTER SEARCH BASED ON REFERENCE POINT
R. P. Beausoleil
Institute of Cybernetic Mathematics and Physics, Cuba.

ROBUST CLUSTERING OF HIGH-DIMENSIONAL DATA
A. Bellas, C. Bouveyron, and M. Cottrell
SAMM, Université Paris 1.

TRANSDISCIPLINARY APPROACH FOR THE DYNAMIC ANALYSIS OF DISEASES SPREAD
J. A. Betancourt*, M. Restrepo**, and A. Muñoz**
*Universidad de las Ciencias Médicas de Camagüey, Cuba. **Universidad del Quindío, Colombia

MULTI-TEMPERATURE HYDRODYNAMIC EQUATIONS FROM KINETIC THEORY FOR RAREFIED GAS MIXTURES
M. Bisi
Università degli Studi di Parma, Italy.

CRAMER'S THEOREM FOR GAMMA RANDOM VARIABLES
S. Bourguin* and C. A. Tudor**
*University Paris 1, ** University Lille 1, France

CRITICAL SETS IN ONE-PARAMETRIC MATHEMATICAL PROGRAMS WITH VANISHING CONSTRAINTS: GENERIC CASE
G. Bouza
Universidad de La Habana, Cuba.

RANKED SET SAMPLING and VARIANCE ESTIMATION
C. N. Bouza* and D. Covarrubias**
*Universidad de La Habana, Cuba. **Universidad Autónoma de Guerrero, Mexico.

This paper is devoted to the analysis of the estimation of the mean of a sensitive
GENERIC CRITICAL POINTS FOR LINEAR EQUILIBRIUM CONSTRAINED PROBLEMS
G. Bouza* and G. Still**
*Universidad de La Habana, Cuba. Universidad de Twente, The Netherlands.

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I. Caamal, P. Fernandez, G. Verna, and A. Pérez
 UACH, Mexico
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A. G. Canen and A. Canen
 Federal University of Rio de Janeiro, Brazil
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P. Caputo, F. Martinelli, and F.L. Toninelli.
 University Roma , Italy.
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E. Carretto
 Universita di Torino, Italy
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L. O. Castellanos* and J. Passamani-Zubelli**
 *Universidad de Holguín, Cuba. **Instituto de Matemática Pura e Aplicada, Brasil.
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 Istanbul Technical University, Turkey
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 Istanbul Technical University, Turkey
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 Universidad de Guadalajara, México
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T. Chou
 University of California, USA.
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B. Cornet*, ** and A. Chateauneuf*
 *Universite Paris I, France. **University of Kansas, USA.
 A COMPUTATIONAL TOOL FOR PERFORMING PRODUCTION AND WAREHOUSE BUDGETS IN AN ENVIRONMENT WITH UNCERTAINTY AND SEASONALITY

J. R. Coronado-Hernández* and J. P. García-Sabater**
 *Universidad Tecnológica de Volver, Colombia. ** Universidad Politécnica de Valencia, Spain.
 AUTOREGRESSIVE PERIODIC MODEL APPLIED TO THE GENERATION OF SYNTHETIC SCENARIOS, INCORPORATING THE IMPACT OF CLIMATE PHENOMENA THROUGH SOI INDEX

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 PUC-RIO, Brazil.
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B. Crawford*, R. Soto*, and E. Monfroy**
 *Pontificia Universidad Católica de Valparaiso, Chile.** Universidad Tecnica Federico Santa Maria, Chile & Universite de Nantes, France
 SHORT SEA SHIPPING AS THE BACKBONE FOR MULTIMODAL FREIGHT TRANSPORT IN THE CARIBBEAN AREA

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 Berlin School of Economics and Law, Germany
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 Rio de Janeiro State University, Brazil
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Rio de Janeiro State University, Brazil
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 Universidad Central Marta Abreu de Las Villas, Cuba
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 *Universidad Nacional Agraria de la Habana, Universidad de La Habana, Cuba.
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*University of Holgun. Cuba. **University of Granada. Spain. *** Centre for the Research and Rehabilitation of Hereditary Ataxias, Holguin. Cuba.

COSTO-EFECTIVIDAD DE INTERVENCIONES CLINICAS FRENTE AL PROBLEMA DE MUERTE NEONATAL EN TABASCO
J. F. Garcia, G. Rodriguez**, A. Garca***, and J. Betancourt***
*Universidad Juárez Autónoma de Tabasco, *Secretara de Salud de Tabasco, México.
***Escuela Nacional de Salud Pública de Cuba, ***Universidad de Camaguey, Cuba

BRANCHING PROCESSES: ILLUSTRATION IN THE PROPAGATION OF THE SPINOCEREBELLAR ATAXIA TYPE 2
K. García*, V. Sistachs**, A. Marrero**, G. Joya***, and L.E. Almager****
*Neurology and Neurosurgery Institute, **Universidad de La Habana, Cuba. ***Malaga University, Spain.
****Clinic for the Research and Rehabilitation of the Hereditary Ataxia, Cuba.

LOGARITHMIC SOBOLEV INEQUALITY APPLIED TO NON-LINEAR CAUCHY PROBLEMS
I. Gentile
Institut Camille Jordan&Universit_e Claude Bernard, France.

NONPARAMETRIC ESTIMATION OF COVARIANCE FUNCTIONS BY MODEL SELECTION (FULLY DATA DRIVEN PROCEDURE)
D. Giniebra* and L. Muniz**
*Institut of Cybernetics, Maths and Physics (ICIMAF), **Universidad de La Habana, Cuba.

CLASSICAL SOLUTIONS FOR A NONLINEAR FOKKER-PLANCK EQUATION ARISING IN COMPUTATIONAL NEUROSCIENCE
M. del Mar González
Universitat Politècnica de Catalunya, Spain.

NON-MONOTONE DEPENDENCES IN VINE ESTIMATION OF DISTRIBUTION ALGORITHMS
Y. Gonzalez-Fernandez*, D. Carrera**, and M. Soto*
*Institut of Cybernetics, Maths and Physics (ICIMAF), **Universidad de La Habana, Cuba.

CONVERGENCE OF THE PRICE OF DOUBLE BARRIER OPTIONS IF BARRIERS GO TO INFINITY AND ZERO
S. M. Grudsky* and C. Palomino-Jiménez**
*CINVESTAV-IPN, **FCFM-FCC-BUAP, Mexico.

ASYMMETRIC BIPARTITE CUT FOR AN IMAGE CLASSIFICATION PROBLEM
V* Guerra, E. Izquierdo**, and A. Bunse-Gerstner***
*Institute of Cybernetic, Mathematic and Physic, Havana, Cuba. **Queen Mary, University of London, UK.
***University of Bremen, Germany.

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H. Haasis and F. Zimmermann H. Wildebrand
Institute of Shipping Economics and Logistics, Bremen, Germany

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O. Hahn, E. Valdés, A. Cabrera, , and Bolaos A. Martín
Universidad Nacional Autónoma de México, México

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* Hardouin, C* and X. Guyon**
*University Paris Ouest, **SAMM, University Paris 1, France.

URBAN SEGREGATION: STOCHASTIC MODELING ENRICHED BY STATISTICAL PHYSICS
A. Hazan and J. Randon-Furling
SAMM, Paris 1 University, France.

COMPARISON BETWEEN ACO AND PSO WHEN APPLIED TO FDI IN THE DC MOTOR BENCHMARK
J. A. Hernández*, L. Camps*, O. Llanes*, and A. J. Silva Neto**

*Instituto Superior Politécnico José Antonio Echeverría, Cuba. **Instituto Politécnico, IPRJ-UERJ, Brazil.
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Y* Hernández and H. Medina-González**

*Instituto de Cibernética, Matemática y Física (ICIMAF), ** Universidad Agraria de la Habana, (UNAH),
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Carmelo Herrera
Universidad de Las Palmas de Gran Canaria, Spain.
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*Universidad Pablo de Olavide, Spain. **Krasnow Institute at George Mason University, USA.
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Benemérita Universidad Autónoma de Puebla, FCFM, Mexico
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J. C. Jiménez* and A. Sotolongo**
*Instituto de Cibernética, Matemática y Física, Cuba.
**Instituto Nacional de Oncología y Radiología, Cuba.
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*Université de Rennes, INRIA and Paris 6,**ENSAE, France. ***INSERM, France.
LOGISTICS-AS-A-SERVICE: ONTOLOGY-BASED ARCHITECTURE AND APPROACH
A. Krizhanovsky*, F. Lin**, *** K. Sandkuhl*, N. Shilov**, A. Smirnov**, and V. Tarasov*
**Jonköping University, Sweden. *St.Petersburg Institute for Informatics and Automation, Russia.
***University of Rostock, Germany.
AN INSURANCE RISK MODEL WITH ORDERED CLAIM ARRIVALS
C. Lefevre* and P. Picard**
*Université Libre de Bruxelles, Belgium. **Université de Lyon, I.S.F.A., France.
APPLICATION MEDIANTE UN MODELO CON RETARDO DE LOS MINIMOS CUADRADOS
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J* Lemagne and A. Calzadilla**
*Universidad de La Habana, ** Instituto de Geofísica y Astronomía, Cuba
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Sh. Liu and J. Segers
S.A.M.M., Université Paris I, France. Université Catholique de Louvain, Belgium.
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S. Loisel
MODELO DE SIMULACION RETARDO PARA EL CONTROL DE LA TRANSMISION DEL DENGUE
L. E.M*. López, A. Muñoz**, G. Olivar*, and J. Betancourt**
*Universidad Nacional de Colombia, Colombia.
*Universidad del Quindío, Colombia.
***Universidad de Ciencias Médicas de Camagüey, Cuba.
DIRAC MASS DYNAMICS IN PARABOLIC EQUATIONS
A* Lorz, S. Mirrahimi**, and B. Perthame*
*Université Pierre et Marie Curie, **France Ecole Polytechnique, France.
A NEW VIEW TO UNCERTAINTY IN ELECTRE III METHOD BY INTRODUCING INTERVAL
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A. Makui and M. Kazem Sayyadi

Iran University of Science and Technology, Iran
BIO-INSPIRATED ALGORITHMS TO THE IMAGE RESTORATION PROBLEM WITH NON CONVEX
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L. R. Marcial*, M. Rivera*, M. de L. Sandoval*, and S. Allende**
*Benemérita Universidad Autónoma de Puebla, México. **Universidad de la Habana, Cuba .

SPIKE PATTERNS IN REACTION-DIFFUSION-ODE SYSTEMS

A* Marciniak-Czochra, K. Suzuki**, G. Karch***, and S. Harting*
*University of Heidelberg, Germany. **University of Wroclaw. **Tohoku University.

AN EQUATION TO DESCRIBE ACOUSTIC WAVES IN A ROTATING COMPRESSIBLE IDEAL
FLUID WHICH HAVE A SPIRAL MOVEMENT ALONG THE ROTATION AXIS

J. Marin
University of Havana, Cuba.

USE OF A CLEARING OPERATOR TO ENCOURAGE DE DEVELOPMENT OF DIVERSITY IN THE
METAHEURISTIC BASED ON SWARMS OF PARTICLES (PSO)

C.A. Martinez, Y. Puris, and R. Bello
Universidad Central Marta Abreu de las Villas, Cuba

TIME SENSITIVITY OF THE OPTION DELTA

M. Mastinsek
University of Maribor, Slovenia.

OPTIMAL PATHS IN GRAPHS, POWERS WITH AN IDEMPOTENT OPERATION, AND AN
APPLICATION TO ANALYSIS OF AGGLOMERATIONS

V. Matveenko
National Research University Higher School of Economics, Russia.

ALGORITMO HIBRIDO BASADO EN OPTIMIZACIÓN POR ENJAMBRE DE PARTÍCULAS Y
RECOCIDO SIMULADO PARA LA SOLUCIÓN DE UN PROBLEMA DE PLANIFICACIÓN DE
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B. E. Medrano*, A. Ruiz**, P.Y. Piñero*, and A. Diaz***
*Universidad de las Ciencias Informáticas, **Universidad de La Habana,***Instituto Superior Politécnico
"Josu Antonio Echeverría", Cuba.

APPLICATION OF FUZZY LOGIC IN HIV/AIDS DYNAMIC IN CUBA.

E. Medvedeva* and Mario Pablo Estrada** Aymee Marrero** Jorge Barrios**
* Instituto Estatal de Moscú de la Técnica Electrónica, Rusia. **Universidad de La Habana, Cuba.

OPTIMIZED KEYWORD SEARCH IN XML DOCUMENTS

B. M. Mendez-Hernandez, R. Moreno-Rodriguez, and G. J. Palencia
Universidad Central Marta Abreu de Las Villas, Cuba.

SISTEMA DINAMICO Y POLINOMIO PREDICTOR PARA ESTIMAR LA RELACION DE
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I. Miranda and H. L. Baños
Centro Nacional de Sanidad Agropecuaria (CENSA), Cuba.

MODELACION DEL BALANCE DE CARGA DOCENTE EN LA UNIVERSIDAD DE CIENFUEGOS

R. Miranda, M. Santana, B. Pérez, Y. Echevarría, and C. A. Alvarez
Universidad de Cienfuegos

NEW APPROACH OF THE NEURAL NETWORK FOR THE FORECASTING OF TOURISM DEMAND
IN TOURISM DESTINATIONS

T* Molinet, M. E. Betancourt*, and J. A. Molinet**
* Multidisciplinary Research Center of Tourism, University of Camagüey, **School of Informatics,
University of Camagüey, Cuba.

CLUSTERING ALGORITHMS FOR REDUCING THE TRAINING SET IN TEXT CLASIFICACION

J. A* Molinet, A. Fonseca**, and R. Gil**
* Facultad de Informática, Universidad de Camagüey, ** Universidad de Oriente, Cuba.

STOCHASTIC SCHRODINGER EQUATIONS WITH UNBOUNDED COEFFICIENTS

C. M. Mora
Universidad de Concepción, Chile

ON GENERAL INSURANCE RISK PROCESSES: AN OVERVIEW AND NEW MODELS

M. Morales
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 Universidad Central Marta Abreu de Las Villas, Cuba.
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 W. Morales*, J. Estrada**, J. Moreno*, and S. Behar*
 *Universidad de la Habana, **Instituto de Cibernética, Matemática y Física, Cuba.
 A NEW APPROACH TO THE CREATION AND PROPAGATION OF EXPONENTIAL MOMENTS IN
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 Universidade Estadual do Ceará, Brazil.
 FUTURE ASYMPTOTICS OF HOMOGENEOUS COSMOLOGICAL MODELS
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 Max Planck Institute for Gravitational Physics, Germany.
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*Universidad de La Habana, Cuba, *IMPA, Brazil

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Autonomous University of Mexico State, Mexico

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M. * Velázquez-Mariño, D. Aguilera-González**, L. Velázquez-Perez ***, and R. Rodríguez-Labrada***

* University of Holguin, Territorial Direction Center of Holguin. Cuban Telecommunication Company, Inc.,

*** Center for the Research and Rehabilitation of Hereditary Ataxias, Cuba.

