Program changes

This is a summary of all lecture changes that have been done since the printing of the Book of Abstracts. You can find the abstracts of the new lectures below the following lists.

Cancelled lectures:

- M. Benchohra (M1, Thursday, 10:00)
- G. Caristi (C1, Thursday, 18:40)
- J. D. Djida (C3, Thursday, 18:40)
- S. Heidarkhani (C1, Thursday, 19:00)
- A. Dellal (C4, Thursday, 19:00)
- A. Boucherif (S4, Friday, 11:45)

Moved lectures:

- N. Gasilov (S5, Tuesday, 16:15 → C3, Thursday, 18:40)
- V. E. Fedorov (C4, Tuesday, 18:00 → C1, Thursday, 18:40)
- M. Plekhanova (C4, Tuesday, 19:00 → C1, Thursday, 19:00)
- G. Holubová (S1, Friday, 11:15 → S1, Wednesday, 12:45)

New lectures:

- F. Ndaïrou (C4, Tuesday, 18:00)
- I. Area (M1, Thursday, 10:00)

International Conference on Nonlinear Analysis and Boundary Value Problems.
September 4-7, 2018, Santiago de Compostela, Spain.

Mathematical modeling of Zika disease in pregnant women and newborns with microchephaly in Brazil

FAÏÇAL NDAÏROU, IVÁN AREA, JUAN J. NIETO, CRISTIANA J. SILVA AND DELFIM F. M. TORRES

Keywords: *Brazil, Epidemiology, mathematical modeling, positivity and boundedness of solutions, stability, Zika virus and microcephaly.*
MSC2010 Classification: 34D20, 92D30.

Abstract

In this talk, we present a new mathematical model for the spread of Zika virus. The model is described by a set of nonlinear ordinary differential equations, that depend on the dynamics of the Dengue mosquito [2] and different classes of women population according to their disease status. Special attention is paid to the transmission of microcephaly. Numerical simulations show the accuracy of the model with respect to the Zika outbreak occurred in Brazil.

References

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[2] H. S. Rodrigues, M. T. T. Monteiro, D. F. M. Torres, and A. Zinober, Dengue disease, basic reproduction number and control, *Int. J. Comput. Math.* **89**(3) (2012), 334–346.

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Faïçal Ndaïrou
African Institute for Mathematical Sciences, AIMS-Cameroon, P.O. Box 608, Limbé Crystal Gardens, South West Region, Cameroon.
e-mail: faical.ndairou@aims-cameroon.org

Iván Area
Universidade de Vigo, Departamento de Matemática Aplicada II, E.E. Telecomunicación, Campus Lagoas-Marcosende, 36310 Vigo, Spain.
e-mail: area@uvigo.es

Juan J. Nieto
Universidade de Santiago de Compostela, Facultade de Matemáticas, 15782 Santiago de Compostela, Spain
e-mail: juanjose.nieto.roig@usc.es

Cristiana J. Silva and Delfim F. M. Torres
University of Aveiro, Department of Mathematics, 3810–193 Aveiro, Portugal
e-mail:cjoaosilva@ua.pt and delfim@ua.pt

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On numerical computation of zeros of orthogonal polynomials

IVÁN AREA

Keywords: *Orthogonal polynomials, Zeros of orthogonal polynomials, numerical computation.*
MSC2010 Classification: 33C45, 42C05, 65D30, 65D32.

Abstract

If $d\mu(x)$ is a given Borel measure on $[a,b] \subset \mathbb{R}$ whose support contains at least N distinct points, for every $n \in \mathbb{N}$ with $n < N$, there exists a unique quadrature formula of the form

$$\tilde{I}(F) = \int_a^b F(x)d\mu(x) \approx \sum_{k=1}^{n} A_k F(z_{n,k}) := \widetilde{Q}_{G,n}(F), \tag{1}$$

which is exact for all polynomials of degree $2n-1$. This quadrature rule is known as the Gaussian type one. It is completely characterised by the following two facts. First, its nodes coincide with the zeros $z_{n,k}$ of the polynomial $p_n(x)$, which is orthogonal with respect to the measure $d\mu(x)$ to every polynomial $q(x)$ of degree at most $n-1$, i.e., $\tilde{I}(p_n q) = 0$. Second, $\widetilde{Q}_{G,n}(F)$ is an interpolatory quadrature formula which means that $A_k = \tilde{I}(p_n(x)/((x - z_{n,k})p_n'(z_{n,k})))$.

In this talk some results about the numerical computation of the zeros of a sequence of orthogonal polynomials will be presented.

References

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Iván Area
Departamento de Matemática Aplicada II, E.E. Aeronáutica e do Espazo, Universidade de Vigo, 32004-Ourense, Spain.
e-mail: area@uvigo.es