Preface to BIT 53:4

Axel Ruhe

Published online: 14 November 2013
© Springer Science+Business Media Dordrecht 2013

This year, we wind up BIT with a selection of papers from our regular stream of contributions. I note that now we have quite a few manuscripts in the Approximation area, both geometric design and numerical cubature, as well as some contributions to Numerical Linear Algebra. Only one paper deals with properties of time stepping methods for differential equations. But rest assured, more is coming up next year!

These are the papers:

Assyr Abdulle, Gilles Vilmart, and Konstantinos Zygalakis investigate the stability properties of integrators for Itô stochastic differential equations. They derive a singly diagonally implicit Runge Kutta method of weak second order, and compares its stability region to existing variants. Mean square and asymptotic stability is considered, as well as different variants of A stability.

A.K.B. Chand and P. Viswanathan study shape preservation aspects of cubic Hermite fractal interpolation functions. They get a desirable shape by putting constraints on values of function and derivative at the knot points. Scaling factors in the subintervals are chosen, to force the function to stay inside a rectangle.

Raffaele D'Ambrosio, Ernst Hairer, and Christophe J. Zbinden study long term integration of a conservative dynamical system. They prove that G-symplecticity of a general linear method implies conjugate-symplecticity of the underlying one step method.

Catterina Dagnino, Paola Lamberti, and Sara Remogna construct new cubature rules for 3D integrals, based on spline quasi-interpolants, expressed as linear combinations of scaled and translated boxes and local linear functionals. Nodes and weights are given, as well as error bounds.

A. Ruhe (✉)

Numerical Analysis Group, School of Science (SCI), Royal Institute of Technology (KTH), 10044, Stockholm, Sweden
e-mail: ruhe@kth.se

Erik Martin-Dorel, Guillaume Melquiond, and Jean-Michel Muller study floating point computation in the practically interesting case where some parts of the computation are done in a higher precision than the original data. These computations are often a part of a much larger process, and then predictability is of importance, in order to get reliable bounds on the error imposed.

Ralf Hiptmair, Carlos Jerez-Hanckes, and Christoph Schwab study the Maxwell cavity source problem in the frequency domain. They use discretization by means of sparse tensor edge elements, in the case when a full tensor product gives rise to a basis of too high a dimension.

Tsung-Ming Huang, Zhongxiao Jia, and Wen-Wei Lin project a quadratic eigenvalue problem on a subspace, giving Ritz approximations to eigenvalues and eigenvectors. When the angle between an eigenvector and the subspace gets small, the Ritz values converge to the eigenvalue. They introduce the use of refined Ritz vectors which are proved to converge towards an eigenvector.

Zhongxiao Jia and Qian Zhang do a systematic study on how to choose drop tolerance to obtain a sparse approximative inverse, to be used in a preconditioned iterative algorithm for a nonsymmetric linear system.

Shishun Li and Zhengda Huang consider multigrid methods for nonselfadjoint elliptic problems, using a Hermitian/skew-Hermitian splitting as smoother. These iterations converge uniformly, even without a full elliptic regularity assumption, provided that the mesh size of the coarsest grid is sufficiently small, independent of the number of levels.

Marie-Laurence Mazure studies rational functions used for computer aided geometric design. They form an extended Chebyshev space that can be built up by a basis of quotients between Bernstein polynomials. This establishes a relation between Chebyshev spaces good for design and rational functions based on them, and offers new insights on rational Bézier curves.

Yujie Zhang and Yangfeng Su describe a two-level orthogonalization Arnoldi process to reduce a high dimensional delay system into a reduced order delay system. It needs less memory than the standard method, which is based on linear Arnoldi.

Referees

It is a recurring pleasure for me to acknowledge all of you that have helped us to keep the quality and readability of BIT. As is our custom, the referee of each paper is unknown to the author, yet we are all the ones that form, what we use to call the BIT family. Thank you all, editors, referees, and publishers for another good year with BIT!

These are the referees that I found in the files of BIT this year. Forgive me if I have missed someone that properly should deserve to be here:

Ben Adcock
Ravi P Agarwal
Pierluigi Amodio
Andreas Asheim
Winfried Auzinger

Gerard Awanou
Lori Badea
Zhong-Zhi Bai
Johnathan M Bardsley
Domingo Barrera

Roland Becker
Bernhard Beckermann
John Belward
Sergio Blanes
Peter Blomgren

Paola Boito
Matthias Bollhöfer
J. P. Boyd
Richard P Brent
Evelyn Buckwar

Kevin Burrage
Pamela Burrage
Albrecht Böttcher
Marco Caliarì
Felix Carbonell Gonzáles

Andrea Censi
Bilal Chanane
Philippe Chartier
Snorre H. Christiansen
Julianne Chung

Emil M. Constantinescu
Tobias Damm
Eric Darrigrand
Oleg Davydov
Johan De Villiers

Kristian Debrabant
Vittoria Demichelis
Weihua Deng
Josef Dick
Luca Dieci

Marco Donatelli
Cedric Effenberger
Yuli Eidelman
Lars Eldén
Jinyan Fan

Lihong Feng
Mahadevan Ganesh
Asghar Ghorbani
Oliver Gibary
Ron Goldman

Hector Gomez
Willy Govaerts
Ivan Graham
Andreas Griewank
Volker Grimm

Nicola Guglielmi
Hongbin Guo
Weihong Guo
Johnny Guzman
Mert Gürbüzbalaban

Stefan Güttel
Wolfgang Hackbusch
Thomas Hagstrom
Ernst Hairer
Harri Hakula

Xuli Han
Martin Hanke
Elias Helou
Johan Helsing
Holger Heumann

Nicholas Higham
Inmaculada Higuera
Martin Hutzenthaler
Johan Håstad
Zdzislaw Jackiewicz

Carlo Janna
Elias Jarlebring
Jae-Hun Jung
Mika Juntunen
Lars Karlsson

Linda Kaufman-Grabiner
Eamonn Keogh
Esther Klann
Peter E Kloeden
Othmar Koch

Plamen Koev
Efi Kokipoulou
Richard Kowar
Rolf Krause
Natasa Krejic

Ming-Jun Lai
 Bishnu Lamichhane
 Stig Larsson
 Stephen Lau
 Richard Lehoucq

Daniel Lesnic
 Ren-Cang Li
 Shijun Liao
 Yongdo Lim
 Thorsten Linss

Qiaohua Liu
 Maria Maciel
 Scott MacLachlan
 Alexander Malyshev
 Håkon Marthinsen

Gunnar Martinsson
 Stefano Maset
 Marie-Laurence Mazure
 Robert McLachlan
 William McLean

Gerard Medioni
 Karl Meerbergen
 Christian Mehl
 Gerard Meurant
 Ronald Mickens

Vladimir Mityushev
 Juan Monterde
 Julio Moro
 James Nagy
 Yuji Nakatsukasa

Andreas Neuenkirch
 Hong Diep Nguyen
 Harald Niederreiter
 Touray Nikazad
 Jan Nordström

Eugene O'Riordan
 Peeter Oja
 Sheehan Olver
 Alexander Ostermann
 Brynjulf Owren

Jose M. Peña
 Rodrigo Platte
 Helmut Podhaisky
 Helmut Pottman
 Weifeng Qiu

Ronny Ramlau
 Joachim Rang
 Nils Henrik Risebro
 Mickael Robbe
 Lucia Romani

Miroslav Rozloznik
 Siegfried M. Rump
 Paul Sablonnière
 Miloud Sadkane
 Ahmed Salam

Berkant Savas
 Valeriu Savcenco
 Achim Schaedle
 Othmar Scherzer
 Dominik M Schoetzau

Gabriela Schranz-Kirlinger
 Simon Shaw
 Qin Sheng
 Alexandra Smirnova
 Mark Spijker

Ernst Stephan
 Hai-Wei Sun
 Magnus Svärd
 Lukas Szpruch
 Gustaf Söderlind

Xue-Cheng Tai
 Münevver Tezer Sezgin
 Tianhai Tian
 Francoise Tisseur
 Stanimir Tomov

Ninoslav Truhar
 Warwick Tucker
 Miroslav Tuma
 Stefan Turek
 Andre Uschmajew

Marnix Van Daele
Robert A van de Geijn
Martin Van Gijzen
Erik Van Vleck
Lieven Vandenberghe

Junping Wang
David S Watkins
Yimin Wei
J.A.C. Weideman
Brendt Wohlberg

Bart Vandereycken
Wim Vanroose
Stephen Vavasis
Martin Vohralik
Matthias Voigt

Jianlin Xia
Chuanju Xu
Chao Yang
Qianqian Yang
Antonella Zanna
Shangyou Zhang

Thank you all and see you later in BIT,

A handwritten signature in black ink, appearing to read 'Axel Ruhe', with a long, sweeping horizontal stroke extending to the right.

Axel Ruhe