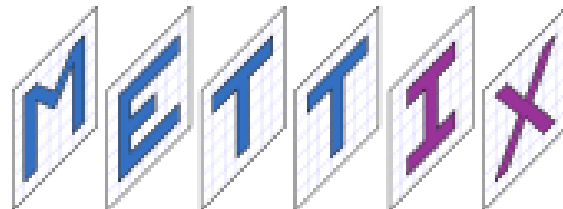


# Matrix Equations and Tensor Techniques IX (METTIX)



## Report of Contributions

Contribution ID: 8

Type: **Extended abstract**

## **Solving PDEs on hypercubes using Chebyshev interpolation**

*Friday, September 10, 2021 2:40 PM (20 minutes)*

**Primary authors:** KRESSNER, Daniel (EPFL); STRÖSSNER, Christoph (EPFL)

**Presenter:** STRÖSSNER, Christoph (EPFL)

**Session Classification:** Talks

Contribution ID: 9

Type: **Extended abstract**

## **Divide and conquer methods for functions of matrices with banded or hierarchical low-rank structure**

*Friday, September 10, 2021 3:20 PM (20 minutes)*

**Primary authors:** CORTINOVIS, Alice (EPFL); KRESSNER, Daniel (EPFL); MASSEI, Stefano (Eindhoven University of Technology)

**Presenter:** CORTINOVIS, Alice (EPFL)

**Session Classification:** Talks

Contribution ID: 10

Type: **Extended abstract**

## **Recent Progresses on Highly Entrywise Accurate Methods For Matrix Equations**

*Thursday, September 9, 2021 11:30 AM (20 minutes)*

**Primary author:** LI, Ren-Cang (University of Texas at Arlington)

**Presenter:** LI, Ren-Cang (University of Texas at Arlington)

**Session Classification:** Talks

Contribution ID: 11

Type: **Extended abstract**

## **A recursive eigenspace computation for the Canonical Polyadic decomposition**

*Friday, September 10, 2021 11:30 AM (20 minutes)*

**Primary authors:** EVERT, Eric (KU Leuven); Mr VANDECAPPELLE, Michiel (KU Leuven); Dr DE LATHAUWER, Lieven (KU Leuven)

**Presenter:** EVERT, Eric (KU Leuven)

**Session Classification:** Talks

Contribution ID: 12

Type: **Extended abstract**

## **Improved variants of the Hutch++ algorithm for trace estimation**

*Thursday, September 9, 2021 4:50 PM (10 minutes)*

**Primary authors:** PERSSON, David (EPFL); CORTINOVIS, Alice (École Polytechnique Fédérale de Lausanne); KRESSNER, Daniel (EPFL)

**Presenter:** PERSSON, David (EPFL)

**Session Classification:** Paper blitz

Contribution ID: 13

Type: **Extended abstract**

## **Multiway data regression using a spline-type tensor decomposition**

*Friday, September 10, 2021 11:50 AM (20 minutes)*

**Primary author:** WIDDERSHOVEN, Raphaël (Stadius - KU Leuven)

**Co-author:** Dr DE LATHAUWER, Lieven (KU Leuven)

**Presenter:** WIDDERSHOVEN, Raphaël (Stadius - KU Leuven)

**Session Classification:** Talks

Contribution ID: 14

Type: **Extended abstract**

## **A mu-mode integrator for solving evolution equations in Kronecker form**

*Friday, September 10, 2021 4:50 PM (20 minutes)*

**Primary authors:** OSTERMANN, Alexander; CASSINI, Fabio (University of Trento); ZIVCOVICH, Franco; EINKEMMER, Lukas; CALIARI, Marco

**Presenter:** CASSINI, Fabio (University of Trento)

**Session Classification:** Talks



Contribution ID: 15

Type: **Extended abstract**

## **Computing the condition number of tensor decompositions through Tucker compression**

*Friday, September 10, 2021 11:10 AM (20 minutes)*

**Primary author:** DEWAELE, Nick (KU Leuven)

**Co-authors:** Dr BREIDING, Paul (MPI MiS); Prof. VANNIEUWENHOVEN, Nick (KU Leuven)

**Presenter:** DEWAELE, Nick (KU Leuven)

**Session Classification:** Talks

Contribution ID: 16

Type: **Extended abstract**

## The Extended Aluthge Transform

*Thursday, September 9, 2021 5:20 PM (10 minutes)*

**Primary authors:** Prof. BENHIDA, Chafiq (Universite de Lille); CURTO, Raul (University of Iowa)

**Presenter:** CURTO, Raul (University of Iowa)

**Session Classification:** Paper blitz

Contribution ID: 17

Type: **Extended abstract**

## **Hierarchical adaptive low-rank format with applications to discretized PDEs**

*Friday, September 10, 2021 3:40 PM (20 minutes)*

**Primary authors:** KRESSNER, Daniel (EPFL); MASSEI, Stefano (Eindhoven University of Technology); ROBOL, Leonardo (University of Pisa)

**Presenter:** MASSEI, Stefano (Eindhoven University of Technology)

**Session Classification:** Talks

Contribution ID: 18

Type: **Extended abstract**

## **Solving the Discrete Euler-Arnold Equations for the Generalized Rigid Body Motion**

*Thursday, September 9, 2021 4:00 PM (20 minutes)*

**Primary author:** CARDOSO, Joao (Instituto Politécnico de Coimbra - ISEC)

**Co-author:** Dr MIRALDO, Pedro (Instituto Superior Técnico, Universidade de Lisboa)

**Presenter:** CARDOSO, Joao (Instituto Politécnico de Coimbra - ISEC)

**Session Classification:** Talks

Contribution ID: 19

Type: **Extended abstract**

## **Non-intrusive model order reduction for cross-diffusion systems**

*Thursday, September 9, 2021 10:15 AM (10 minutes)*

**Primary authors:** Prof. KARASOZEN, Bulent (Department of Mathematics, Middle East Technical University, Ankara, Turkey); Mrs MÜLAYIM, Gülden; Prof. UZUNCA, Murat (Sinop University)

**Presenter:** Prof. UZUNCA, Murat (Sinop University)

**Session Classification:** Paper blitz

Contribution ID: 20

Type: **Extended abstract**

## **Solving large-scale Riccati equations with indefinite quadratic terms**

*Thursday, September 9, 2021 5:00 PM (10 minutes)*

**Primary authors:** BENNER, Peter (Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, Germany); HEILAND, Jan (Max Planck Institute for Dynamics of Complex Technical Systems); Dr WERNER, Steffen (Max Planck Institute for Dynamics of Complex Technical Systems)

**Presenter:** HEILAND, Jan (Max Planck Institute for Dynamics of Complex Technical Systems)

**Session Classification:** Paper blitz

Contribution ID: 21

Type: **Extended abstract**

## **Solving power series matrix equations encountered in stochastic processes by means of fixed point iterations**

*Friday, September 10, 2021 9:00 AM (40 minutes)*

**Primary author:** BINI, Dario Andrea (Department of Mathematics, University of Pisa)

**Presenter:** BINI, Dario Andrea (Department of Mathematics, University of Pisa)

Contribution ID: 22

Type: **Extended abstract**

## **Mixed precision recursive block diagonalization for bivariate functions of matrices**

*Thursday, September 9, 2021 9:45 AM (10 minutes)*

**Primary authors:** MASSEI, Stefano (Eindhoven University of Technology); ROBOL, Leonardo (University of Pisa)

**Presenter:** ROBOL, Leonardo (University of Pisa)

**Session Classification:** Paper blitz



Contribution ID: 23

Type: **Extended abstract**

## **Decoupling Dominant Z-eigenvectors of Tensor Kronecker Products**

*Friday, September 10, 2021 5:10 PM (20 minutes)*

**Primary authors:** COLLEY, Charles (Purdue University); Dr GLEICH, David (Purdue University); Dr NASSAR, Huda (Relational AI)

**Presenter:** COLLEY, Charles (Purdue University)

**Session Classification:** Talks

Contribution ID: 24

Type: **Extended abstract**

## **Inexactness in low-rank methods for large matrix equations**

*Thursday, September 9, 2021 10:05 AM (10 minutes)*

**Primary author:** KÜRSCHNER, Patrick (Leipzig University of Applied Sciences (HTWK Leipzig))

**Presenter:** KÜRSCHNER, Patrick (Leipzig University of Applied Sciences (HTWK Leipzig))

**Session Classification:** Paper blitz

Contribution ID: 25

Type: **Extended abstract**

## **Stein-based preconditioners for weak-constraint 4D-Var**

*Thursday, September 9, 2021 9:55 AM (10 minutes)*

**Primary author:** PALITTA, Davide (Alma Mater Studiorum, Università di Bologna)

**Co-author:** Dr TABEART, Jemima (University of Edinburgh)

**Presenter:** PALITTA, Davide (Alma Mater Studiorum, Università di Bologna)

**Session Classification:** Paper blitz

Contribution ID: 26

Type: **Extended abstract**

## **A Successive Divide and Conquer Algorithm for the Unilateral Quadratic Matrix Equation**

*Thursday, September 9, 2021 3:40 PM (20 minutes)*

**Primary authors:** BENNER, Peter (Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, Germany); KÖHLER, Martin (MPI Magdeburg)

**Presenter:** KÖHLER, Martin (MPI Magdeburg)

**Session Classification:** Talks

Contribution ID: 28

Type: **Extended abstract**

## **Optimal Constant for Generalized Diagonal Update Method**

*Friday, September 10, 2021 10:05 AM (20 minutes)*

**Primary authors:** KIM, Hyun-Min (Department of Mathematics, Pusan National University); JU, Jeong-Hoon; Mr KIM, Young-Jin (Pusan National University)

**Presenter:** JU, Jeong-Hoon

**Session Classification:** Talks

Contribution ID: 29

Type: **Extended abstract**

## **Operator-dependent prolongation and restriction for parameter-dependent multigrid methods using low-rank tensor formats**

*Thursday, September 9, 2021 2:40 PM (20 minutes)*

**Primary author:** Mr WERTHMANN, Tim A. (RWTH Aachen University)

**Co-author:** Prof. GRASEDYCK, Lars (RWTH Aachen University)

**Presenter:** Mr WERTHMANN, Tim A. (RWTH Aachen University)

**Session Classification:** Talks

Contribution ID: 30

Type: **Extended abstract**

## **Low-rank tensor uniformization for tumor progression modeling**

*Thursday, September 9, 2021 3:00 PM (20 minutes)*

**Primary author:** KLEVER, Maren (RWTH Aachen University)

**Co-authors:** Mr GEORG, Peter (University Regensburg); Prof. GRASEDYCK, Lars (RWTH Aachen University); Mr SCHILL, Rudolf (University Regensburg); Prof. SPANG, Rainer (University Regensburg); Prof. WETTIG, Tilo (University Regensburg)

**Presenter:** KLEVER, Maren (RWTH Aachen University)

**Session Classification:** Talks

Contribution ID: 31

Type: **Extended abstract**

# **On Newton Method for the Minimal Positive Solution of a System of Multi-Variable Nonlinear Matrix Equations**

*Friday, September 10, 2021 10:25 AM (20 minutes)*

**Primary author:** KIM, Taehyeong

**Co-author:** Prof. KIM, Hyun-Min (Department of Mathematics, Pusan National University)

**Presenter:** KIM, Taehyeong

**Session Classification:** Talks



Contribution ID: 32

Type: **Extended abstract**

## **A Tensor-Train Dictionary Learning algorithm based on spectral proximal alternating linearized minimization**

*Friday, September 10, 2021 3:00 PM (20 minutes)*

**Primary authors:** BRANDONI, Domitilla (Università di Bologna); SIMONCINI, Valeria (Università di Bologna); Dr PORCELLI, Margherita (Università di Bologna)

**Presenter:** BRANDONI, Domitilla (Università di Bologna)

**Session Classification:** Talks

Contribution ID: 33

Type: **Extended abstract**

## **Palindromic linearization and numerical solution of nonsymmetric algebraic T-Riccati equations**

*Thursday, September 9, 2021 12:10 PM (20 minutes)*

**Primary authors:** MEINI, Beatrice; IANNAZZO, Bruno; PALITTA, Davide; BENNER, Peter

**Presenter:** MEINI, Beatrice

**Session Classification:** Talks

Contribution ID: 34

Type: **Extended abstract**

## **Matrix-oriented FEM formulation for stationary and time-dependent PDEs on x-normal domains**

*Friday, September 10, 2021 4:30 PM (20 minutes)*

**Primary authors:** FRITTELLI, Massimo (Università del Salento); SGURA, Ivonne (Department of Mathematics & Physics, University of Salento, Lecce)

**Presenter:** FRITTELLI, Massimo (Università del Salento)

**Session Classification:** Talks

Contribution ID: 35

Type: **Extended abstract**

## **Elementwise accurate doubling algorithm for shifted M-matrix algebraic Riccati equations**

*Thursday, September 9, 2021 11:50 AM (20 minutes)*

**Primary authors:** ADDIS, Elena (università di Perugia); POLONI, Federico (Università di Pisa); IANNAZZO, Bruno

**Presenter:** ADDIS, Elena (università di Perugia)

**Session Classification:** Talks

Contribution ID: 36

Type: **Extended abstract**

## **On the number of elements needed for low-rank tensor train completion**

*Friday, September 10, 2021 12:30 PM (20 minutes)*

**Primary author:** BUDZINSKIY, Stanislav

**Presenter:** BUDZINSKIY, Stanislav

**Session Classification:** Talks

Contribution ID: 37

Type: **Extended abstract**

## **Matrix Completion with Sparse Measurement Errors**

*Thursday, September 9, 2021 5:30 PM (10 minutes)*

**Primary author:** PETROV, Sergey (INM RAS)

**Presenter:** PETROV, Sergey (INM RAS)

**Session Classification:** Paper blitz

Contribution ID: 38

Type: **Extended abstract**

## **Model order reduction and utilization of the reduced basis for aggregation kinetic equations**

*Thursday, September 9, 2021 5:10 PM (10 minutes)*

**Primary authors:** MATVEEV, Sergey (Marchuk INM RAS and Lomonosov MSU); Mr TIMOKHIN, Ivan (Lomonosov Moscow State University); Prof. TYRTYSHNIKOV, Eugene (Marchuk INM RAS)

**Presenter:** MATVEEV, Sergey (Marchuk INM RAS and Lomonosov MSU)

**Session Classification:** Paper blitz

Contribution ID: 39

Type: **Extended abstract**

## **A distance formula for tuples of doubly commuting matrices**

*Thursday, September 9, 2021 10:25 AM (10 minutes)*

**Primary authors:** SINGLA, Sushil (Shiv Nadar University); Dr GROVER, Priyanka (Shiv Nadar University Delhi NCR)

**Presenter:** SINGLA, Sushil (Shiv Nadar University)

**Session Classification:** Paper blitz



Contribution ID: 40

Type: **Extended abstract**

# Randomized Algorithms for Rounding the Tensor Train Format

*Friday, September 10, 2021 12:10 PM (20 minutes)*

**Primary author:** AL DAAS, Hussam (STFC, Rutherford Appleton Laboratory)

**Presenter:** AL DAAS, Hussam (STFC, Rutherford Appleton Laboratory)

**Session Classification:** Talks

Contribution ID: 41

Type: **Extended abstract**

## **On the low-rank approximations in the Chebyshev norm**

*Friday, September 10, 2021 5:30 PM (20 minutes)*

**Primary authors:** MOROZOV, Stanislav (Marchuk Institute of Numerical Mathematics of the Russian Academy of Sciences); Prof. ZAMARASHKIN, Nikolai; Prof. TYRTYSHNIKOV, Eugene (Marchuk INM RAS)

**Presenter:** MOROZOV, Stanislav (Marchuk Institute of Numerical Mathematics of the Russian Academy of Sciences)

**Session Classification:** Talks

Contribution ID: 42

Type: **Extended abstract**

## **Solution of the matrix equation for geodesics associated with the Riemannian metric on the space of positive-definite matrices based on the power potential**

*Friday, September 10, 2021 9:45 AM (20 minutes)*

**Primary author:** MOAKHER, Maher (University of Tunis El Manar)

**Co-authors:** IANNAZZO, Bruno; Dr CHOUAIEB, Nadia (University of Tunis El Manar)

**Presenter:** MOAKHER, Maher (University of Tunis El Manar)

**Session Classification:** Talks

Contribution ID: 43

Type: **Extended abstract**

## **On the consistency of $X^T AX = B$ when $B$ is either symmetric or skew**

*Thursday, September 9, 2021 11:10 AM (20 minutes)*

**Primary authors:** Dr BOROBLA, Alberto (Universidad Nacional de Educación a Distancia); Dr CANOGAR, Roberto (Universidad Nacional de Educación a Distancia); DE TERÁN, Fernando (Universidad Carlos III de Madrid)

**Presenter:** DE TERÁN, Fernando (Universidad Carlos III de Madrid)

**Session Classification:** Talks

Contribution ID: 44

Type: **Extended abstract**

## **A matrix-oriented POD-DEIM algorithm applied to semilinear differential matrix equations**

*Thursday, September 9, 2021 12:30 PM (20 minutes)*

**Primary authors:** KIRSTEN, Gerhard (University of Bologna); SIMONCINI, Valeria (Universita' di Bologna)

**Presenter:** KIRSTEN, Gerhard (University of Bologna)

**Session Classification:** Talks

Contribution ID: 45

Type: **Extended abstract**

## **A predictor-corrector method in quantized tensor train format for the equilibrium of the chemical master equation**

*Thursday, September 9, 2021 3:20 PM (20 minutes)*

**Primary authors:** Ms DINH, Trang; Prof. SIDJE, Roger B.; Dr REID, Brandon M.

**Presenter:** Ms DINH, Trang

**Session Classification:** Talks

Contribution ID: 47

Type: **Extended abstract**

## **From analysis to learning: Tensor-based assessment of latent similarity**

*Thursday, September 9, 2021 9:00 AM (40 minutes)*

**Primary author:** Dr DE LATHAUWER, Lieven (KU Leuven)

**Presenter:** Dr DE LATHAUWER, Lieven (KU Leuven)