وزارة التعليم العالي والبحث العلمي

Université Badji Mokhtar Annaba

جامعة باجي مختار عنابة

NATIONAL SEMINAIR ON MODERN MATHEMATICS & APLICATIONS

MMA'24 LMA-LaPS -LANOS

Annaba, du 06 au 08 Octobre 2024

Faculté des Sciences
Département de Mathématiques

ATTESTATION

Je soussigné coordinateur du comité d'organisation des Journées Scientifiques **MMA' 24** *qui se sont tenues à l'Université* Badji Mokhtar-Annaba du *06 - 08 octobre 2024, atteste par la présente que :* **Basti Bilal**

a participé aux *journées, et présenté* ***une communication Poster*** *intitulée :*

" Modeling Physical Phenomena Using Fractional Partial Differential Equations "

Co-auteur : Dr **Rabah Djemiat**

Annaba, le 06/10/2024

Coordinateur

Pr. L.Chorfi

Laboratoire LMA

Laboratoire LaPS

Laboratoire LANOS

Modeling Physical Phenomena Using Fractional Partial Differential Equations

Bilal Basti[1], **Rabah Djemiat**[2]

[1] *Laboratory of Pure and Applied Mathematics, Mohamed Boudiaf University of M'sila, Algeria.*
E-mail: bilalbasti@gmail.com; rabahdjemiat19@gmail.com

Abstract: This paper studies the existence and uniqueness of radially symmetric solutions for a multidimensional nonlinear time and space-fractional reaction-diffusion/wave equation that enables treating vibration and control, signal and image processing, and modeling earthquakes, among other physical phenomena. Additionally, applying Schauder's and Banach's fixed point theorems facilitates identifying the existence and uniqueness of solutions for the selected equation.
Keywords: Reaction-diffusion/wave; radially symmetric solutions; existence, uniqueness.
2010 Mathematics Subject Classification: Primary 35R11; 35C06.

1 Introduction

In this work, we shall give an example of a class of fractional-order's PDEs, which helps to describe various complex phenomena; it is a multidimensional nonlinear time and space-fractional reaction-diffusion/wave equation and is written as follows:

$$\begin{cases} \partial_t^{\alpha} u - \kappa^2 \Delta u = F\left(t, x, u, \partial_t^{\beta} u, (-\Delta)^s u\right), & 0 < s \leq 1,\ 1 < \beta \leq \alpha \leq 2 \\ u(0,x) = |x|^{\delta} u_0,\ \frac{\partial u}{\partial t}(0,x) = 0, & \delta, u_0 \in \mathbb{C}, \end{cases} \tag{1.1}$$

where $u = u(t,x)$ is a scalar function of time and space variables $(t,x) \in \Omega = [0, T_\varepsilon] \times [\varepsilon/\sqrt{m}, +\infty)^m$ for $\varepsilon, \ell > 0$, and $T_\varepsilon = \ell \varepsilon^{\frac{2}{\alpha}}$ with $m \in \mathbb{N}$. Also $F : \Omega \times \mathbb{C} \times \mathbb{C} \times \mathbb{C} \to \mathbb{C}$ is a nonlinear function, $\kappa \in \mathbb{R}^*$ is a real constant the symbol $(-\Delta)^s$ defines the fractional Laplacian operator [1].
This paper's contribution regards determining the existence, uniqueness, and main properties of the general solution of stability problems obtained through replacing classical rules with fractional quadrature rules of the radially symmetric solution (see [1, 2, 3]),

$$u(t,x) = |x|^{\delta} f\left(|x|^{-\frac{2}{\alpha}} t\right), \text{ for } |x| = \sqrt{x_1^2 + \cdots + x_m^2}, \text{ and } \delta \in \mathbb{C}, \tag{1.2}$$

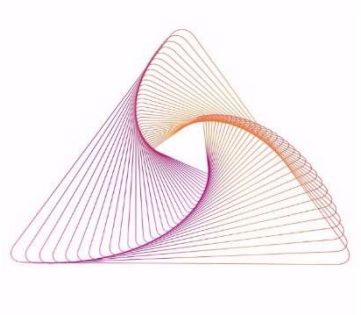
the basic profile f is not known in advance and is to be identified.

References

[1] B. Basti, R. Djemiat, and N. Benhamidouche, *Theoretical studies on the existence and uniqueness of solutions for a multidimensional nonlinear time and space-fractional reaction-diffusion/wave equation*, Mem. Differ. Equ. Math. Phys., **89** (2023), 1–16.

[2] B. Basti and N. Benhamidouche, *Existence results of self-similar solutions to the Caputo-type's space-fractional heat equation*, Surv. Math. Appl., **15** (2020), 153–168.

[3] R. Djemiat, B. Basti, and N. Benhamidouche, *Cauchy problem for Jordan-Moore-Gibson-Thompson equations of nonlinear acoustics with fractional operators*, An. Stiint. Univ. Al. I. Cuza Iasi. Mat., **69**(2) (2023), 143–161.



National seminair on Modern Mathematics & Applications - MMA24

6, 7, et 8 octobre 2024, Université Badji Mokhtar, Annaba, Algérie

Programme
et
résumé des plénières

Résumées des conférences plénières

A non parametric distribution-free test of independence among continuous random vectors based on L_1-norm

S. Bouzebda

Université de Compiègne, France
E-mail:

Abstract: Le test d'indépendance parmi des vecteurs continus multivariés est une tâche fondamentale mais complexe en statistiques. Notre contribution réside dans le développement d'un test basé sur la norme L_1 conçu pour évaluer l'indépendance multivariée, représentant ainsi une première du genre. Bien que le test basé sur L_1, entre la fonction de densité jointe et le produit des densités marginales associées aux vecteurs présumés indépendants, présente des caractéristiques attrayantes, ses fondements théoriques ont été difficiles à établir. Sous l'hypothèse nulle, nous utilisons des techniques de poissonisation pour établir l'approximation normale asymptotique de la statistique de test correspondante, sans imposer d'hypothèses de régularité sur la fonction de densité de Lebesgue sous-jacente. De manière remarquable, nous observons que la distribution limite des statistiques basées sur L_1 ne dépend pas du modèle. Ce résultat inattendu contribue à la robustesse et à la polyvalence de notre méthode. De plus, nos tests présentent une puissance locale non triviale contre un sous-ensemble d'alternatives locales, qui convergent vers l'hypothèse nulle à un taux de $n^{-1/2}h_n^{-d/4}$, où n représente la taille de l'échantillon et h_n désigne la largeur de bande. Enfin, la théorie est soutenue par une étude de simulation approfondie visant à examiner les performances en échantillon fini de notre test proposé. Les résultats démontrent que notre procédure de test surpasse généralement les approches existantes dans divers scénarios examinés.

NUMERICAL APPROACH OF SOME EVOLUTION PROBLEMS FOR NONLINEAR (F)PDEs FROM BIOLOGY

Nasserdine KECHKAR

Department of Mathematics and Informatics,
University Larbi Ben M'hidi, Oum El Bouaghi
E-mail: nasserdine.kechkar@univ-oeb.dz
kechkar.nasserdine@umc.edu.dz

Abstract: Reaction-diffusion (RD) equations play an important role in the simulation of systems in biology and medicine. A lot of numerical methods have been developed for classes of RD equations arising in biology and medicine. Additionnally to the classical numerical techniques (FD, FE, FV), other computational approaches also exist. Fractional calculus (FC) has been playing a crucial role in various fields of applied sciences. It has some potential to change the model approach and control the results in order to tune with the realistic data. Beside its impact on problems with anomalous behavior, it was observed that FC can provide efficient numerical models having better consistencies with known data. The objective of the talk is to give a brief insight to some existing numerical methods on a simple model problem for an RD equation with integer and/or fractional orders. A brief review of some existing related works is also provided.

Keywords: reaction-diffusion, fractional derivative, finite volumes, finite elements, element free Galerkin, operator splitting.

References

[1] S. ABBAS, M. BENCHOHRA, G. M. N'GUEREKATA. Topics in fractional differential equations. 2012.

[2] B. BAEUMER, M. KOVACS, M.M. MEERSCHAERT (2008). Numerical solutions for fractional reaction–diffusion equations, Computers and Mathematics with Applications.

[3] K.B. OLDHAM, J. SPANIER. The fractional calculus: Theory and applications of differentiation and integration to arbitrary order. 2006.

[4] R. SAXENA, A. MATHAI, J. HAUBOLD. Fractional reaction-diffusion equations. 2006.

[5] J. SINGH, D. KUMAR, A. KILIGMAN (2014). Numerical solutions of nonlinear fractional partial differential equations arising in spatial diffusion of biological populations, Abstract and Applied Analysis.

[6] A. TURING (1952). The chemical basis of morphogenesis, Philosophical Transactions of the Royal Society of London.

Ultrasound Tomography using Resonant Perturbations

A. Ghandriche[1], S. Senapati[2] and M. Sini [3]

[1] *Nanjing Center for Applied Mathematics, China*
[2] *Radon Institute, Austria*
[3] *Radon Institute, Austria*
E-mail: mourad.sini@oeaw.ac.at

Abstract: A standard family of inverse problems in waves-based imaging use wave fields measured remotely to recover internal variations of the material properties (as the acoustic, optic, elastic and thermal ones). Usually this needs to use multiple interogations (i.e. multiple emitters-receivers) and the related inverse problems are highly nonlinear and unstable.

In the recent years, it is proposed in the engineering literature to inject small-scaled contrast agents into the object to image and then perform the experiments. With such perturbations, one needs only few interogations. In addition, we can expect a better stability and locality of the reconstruction, i.e. we can do the imaging only, locally, where it is needed, and have access to 'explicit' reconstruction formulas.

At the mathematical analysis level, the main advantage is that such contrast agents resonate at certain frequencies. Such resonant frequencies are well understood and can be characterized via the two main operators appearing in the underlying wave-propagators, namely the Newtonian type and the Magnetization type operators. The general features of our findings are as follows:

1. Using time-harmonic measurements, in a band of frequencies, we can recover the already mentioned resonances. These resonances have the explicit signature of the material properties of the object (as the speed of propagation) which allows to reconstruct them.

2. Using time-domain measurements, in a large enough time, we can recover the internal values of the travel time function. Using the related Eikonal equation, for instance, we can reconstruct the related speed of propagation.

In the talk, we will use the acoustic model (i.e. ultrasound tomography) to highlight these features. But, if time allows it, we will briefly discuss the related results in optical tomography and opto-acoustic tomography (i.e. photo-acoustics).

Keywords: Ultrasound Tomography, Subwavelength Resonances, Integral Equations, Asymptotic Analysis.

References

[1] A. Dabrowski, A. Ghandriche, M.Sini. (2021). Mathematical analysis of the acoustic imaging modality using bubbles as contrast agents at nearly resonating frequencies. Inverse Problems and Imaging.

[2] S. Senapati, M. Sini. (2023). Minnaert Frequency and Simultaneous Reconstruction of the Density, Bulk and Source in the Time-Domain Wave Equation. arXiv:2311.08114.

[3] M. Sini; H. Wang. (2022) The inverse source problem for the wave equation revisited: a new approach. SIAM J. Math. Anal.

[4] A. Ghandriche and M. Sini. (2023). Simultaneous Reconstruction of Optical and Acoustical Properties in Photo-Acoustic Imaging using Plasmonics. SIAM J. Appl. Math.

A tutorial on inverse and ill-posed problems for anomalous diffusion phenomena

Boussetila Nadjib [1,a]

[1] *Department of Mathematics, University 8 May 1945 Guelma, Algeria*
[a] *Applied Mathematics Laboratory, University BMA, Algeria*
E-mail: n.boussetila@univ-guelma.dz, n.boussetila@gmail.com

Abstract: This talk focuses on a survey and some remarks on inverse and ill-posed problems for anomalous diffusion phenomena. We present new results on regularization methods that have been recently established for backward and generalized elliptic equations, along with unresolved questions in this field.
Keywords: Ill-posed problems, backward problem, time-fractional evolution equations, Generalized elliptic equations, regularization methods.
2010 Mathematics Subject Classification: 35J25, 35R11, 35R30, 35R25, 35R30, 47A52.

References

[1] B. Kaltenbacher, W. Rundell. Inverse Problems for Fractional Partial Differential Equations Volume: 230; AMS 2023.

Stabilité d'un problem inverse de la théorie de scattering

L. Chorfi

Department de mathematiques, Badji Mokhtar Université, Annaba
E-mail: l_chorfi@hotmail.com

Résumé. On considère le problème inverse de la diffraction d'ondes suivant. Il s'agit de retrouver le potential $p(x) = 1 - q(r)$, où q est une fonction radiale, à partir du champ lointain de l'onde diffractée qui est solution de l'équation de Helmholtz

$$\triangle u + k^2 p(x) u = 0 \text{ dans } \mathrm{R}^2 \tag{0.1}$$

où $u = u^{sc} + u^{inc}$ est le champ total, $u^{inc}(x) = e^{ikd\cdot\hat{x}}$ est l'onde incidente and k^2 l'énergie totale de l'onde (nombre d'onde). Dans [2] on a proposé un algorithme de reconstruction. Dans cet exposé on va étudier la stabilité, pour cela on utilisera surtout les travaux [1, 4].

Keywords: Far-field data, Inverse scattering, Stability.

References

[1] A. L. Bukhgeim , *Recovering a potential from the Cauchy data in the two-dimensional case*, J. Inv. Ill-Posed Problems. 2008. v. 16, 1. P. 19–33.

[2] I. Djerrar, I. Khélifa, and L. Chorfi, *Determining radially symmetric potential from far-field scattering data*, Afrika Matematika (2023) 34:13

[3] A. Kirsh, *An Introduction to The Mathematical Theory of Inverse Problems*, Springer Science and Business Media, Vol. 120, 2011.

[4] P Stefanov, *Stability of the inverse problem in potential scattering at fixed energy*, Annales de l'institut Fourier, tome 40, no 4 (1990), p. 867-884

Programme

National seminair on Modern Mathematics & Applications - MMA24

6, 7, et 8 octobre 2024, Université Badji Mokhtar, Annaba, Algérie

06-oct-24

8h:00	*9h:00*	**Reception et enregistrement**	
9h:00	*9h:30*	**Ceremonie d'ouverture**	
9h:30	*10h:15*	**Amphi**	
Plénière		**S. Bouzebda**	
		Chairman : *H. Zaghdoudi*	
		A non parametric distribution-free test of independence among continuous random vectors based on L_1-norm	
10h:15	*10h:45*	**Pot de bienvenue et session poster**	
Posters		**Bouabsa Wahiba** KNN estimation of signle indexe relative error methode	
		Djebaili Manel Étude de l'existence des solutions d'un problème fractionnaire par application d'un théorème topologique	
		Salah BenMahmoud New results on variable Besov spaces	
		Benaouad Oumelkheir Asymptotic normality of The nonparametric estimator of the regression function: Functional case	
		Bourobta Ahmed Examining the possibility of finding solutions for singular and degenerate fractional nonlinear parabolic Dirichlet problems	
		DraifiaAla Eddine Exponential decay for the solution of semilinear viscoelastic wave equations with localized damping	
		Draifia Ala Eddine Exponential decay for the solution of semilinear viscoelastic wave equations with localized damping	
		يوسف عشيرةسارة Numerical solution of stochastic Volterra integral equations	
		Mansour Mouchira Existence result of nonconvex differential inclusion	
		Guendouzi Abdelhak Cost optimization of a queueing system with differentiated working vacation, Bernoulli schedule vacation interruption, waiting server and	
		Basti Bilal Modeling Physical Phenomena Using Fractional Partial Differential Equations	
10h:45	*11h:45*	**Session de communications orales**	
		Chairman : A. Makhlouf	**Chairwoman** : A. Chadli
10h:45	*11h:00*	**Salle 1**	**Salle 2**
Communications		**B. Khelili**	**Nom : W. Bouguern**
		Titre : *Tow-parameter quasi-boundary value method for a backward abstract*	**Titre :** *Solving a class of bilevel programming problems using the regularization technique in the lower-level problem*
		Chairman : A. Makhlouf	**Chairwoman** : A. Chadli
11h:00	*11h:15*	**Salle 1**	**Salle 2**
Communications		**L. Diabi**	**B. Neggal**
		Titre : *On Chaos, Control, and Synchronization in Fractional Difference Equations*	**Titre :** *Regularized Sinc Collocation Method for Solving Fredholm Integral Equations of the First Kind*
		Chairman : A. Makhlouf	**Chairwoman** : A. Chadli
11h:15	*11h:30*	**Salle 1**	**Salle 2**
Communications		**A. Benguesmia**	**D. C. Benchettah**
		Titre : *Inverse Problem Of a Parabolic Equation With An Integral Overdetermination Condition*	**Titre :** *Sub-solution approach for the asymptotic behavior of a parabolic variational inequality related to American options problem*
		Chairman : A. Makhlouf	**Chairwoman** : A. Chadli

11h:30	*11h:45*	**Salle 1**	**Salle 2**
Communications		**H. Boutebba** **Titre :** *Nontrivial solution for a class of fractional Kirchhoff-Schrödinger-Poisson type systems*	**S. Boudjelda** **Titre :** *An exact algorithm for the weighted portfolio selection problem with bounded assets*
		Chairman : A. Makhlouf	**Chairwoman** : A. Chadli
11h:45	*12h:00*	**Salle 1**	**Salle 2**
Communications		**N. Belkhir** **Titre :** *On a thermoelastic Pourous system without the second spectrum*	**A. Elbahi** **Titre :** *Positive periodic solutions of a kind of nonlinear iterative differential equations with impulse effects*
		Chairman : A. Makhlouf	**Chairwoman** : A. Chadli
12h:00	*12h:15*	**Salle 1**	**Salle 2**
Communications		**S. Madi** **Titre :** *Restricted Additive Schwarz Method for non coercive Variational Inequalities*	**H. Melki** **Titre :** *N-Dimensional Zero-Hopf Bifurcation*
		Chairman : A. Makhlouf	**Chairwoman** : A. Chadli
12h:15	*12h:30*	**Salle 1**	**Salle 2**
Communications		**C. Timimoun** **Titre :** *ChahnazOn the stabilization of a quasilinear equation on a bounded domain*	**A. Mouhous** **Titre :** *Théorie du Point Fixe et Somme de Deux Opérateurs : Perspectives Théoriques et Application*
		Chairman : A. Makhlouf	**Chairwoman** : A. Chadli
12h:30	*12h:45*	**Salle 1**	**Salle 2**
Communications		**R. Gherdaoui** **Titre :** *Convergence of the solution of Transport-diffusion Equation to that of Transport Equation*	**A. A. Fellag** **Titre :** *some properties of non normal operators on hilbert spaces*
13h:00	*14h:00*	**Déjeuner**	
14h:00	*14h:45*	**Amphi**	
Plénière		**L. Chorfi** **Chairman :** *M. Haiour* **Stabilité d'un problem inverse de la théorie de scattering**	
14h:45	*15h:15*	**Pause café et session de posters**	
Posters		**Arafa Ghada** Estimation des primes des contrats d'assurance générale à l'aide du modèle de crédibilité de Bühlmann.	
		Chinoune Hanane Application of Homotopy perturbation method for solving fractional differential equations	
		Alik Youssouf Semilinear Elliptic Equation with Critical Hardy-Sobolev	
		Roufaida Ketfi Variational study of a contact mechanics problem with fractional derivatives	
		Bayarassou Nassima Asymptotic properties of a relative regression function estimator for complete data under alpha-mixing condition	
		Bouzoualegh Ikram L∞-error estimate of generalized Schwarz algorithm for elliptic quasi-variational inequalities related to impulse control problem	
		Rebiai Ghania Darboux problem of conformable partial differential equation	
		Adoui Ahlem On a Sequential Fractional Boundary Value Problem with nonlocal boundary conditions	
		Boukemara Ibtissem Multistability and chaotic attractors in two-dimensional piecewise systems	
		Fekrache Zine eddine A Generalized Differential-Algebraic Biological Economic System with Hybrid Functional Response and Predator Harvesting exhibits stability and	
		Benatmane Chaabane *Modified Poisson Process: Theoretical Framework and Ruin Model Applications*	
		Belakhdar Sarra The sequential design and Bayesian approaches to data analysis	

		Settara Loubna An inverse source time-fractional diffusion problem via an input-output mapping	
15h:15	*16h:30*	**Session de communications orales**	
		Chairman : *M.S. Chibi*	**Chairman** : *A. Laouar*
15h:15	*15h:30*	**Salle 1**	**Salle 2**
Communications		**A. Zaarat**	**M. Merahi**
		Titre: *Optimizing Linear Programs with Advanced Mixed Variable Techniques*	**Titre :** *Modélisations épidémiologiques en épidémiologie*
		Chairman : *M.S. Chibi*	**Chairman** : *A. Laouar*
15h:30	*15h:45*	**Salle 1**	**Salle 2**
Communications		**H. Bouraoui**	**F. Boudersa**
		Titre : *Exponential stability of Timoshenko beams with three-phase-lag thermoelasticity*	**Titre :** *Well posdeness of the dispersion-generalized periodic Kdv equation in Gevrey spaces*
		Chairman : *M.S. Chibi*	**Chairman** : *A. Laouar*
15h:45	*16h:00*	**Salle 1**	**Salle 2**
Communications		**Z. Kaid**	**M. Bahi**
		Titre : *A phenotype-structured model for tumour-immune response with immunotherapy*	**Titre :** *Uniform convergence of f parabolic variational inequality non-linear and its implementation*
		Chairman : *M.S. Chibi*	**Chairman** : *A. Laouar*
16h:00	*16h:15*	**Salle 1**	**Salle 2**
Communications		**W. Chougar**	**Z. Antouri**
		Titre : *Null controllability of linear heat equation with mixed boundary conditions*	**Titre :** *Influence of diffusion coefficients on the Spatial spread of Babesiosis*
		Chairman : *M.S. Chibi*	**Chairman** : *A. Laouar*
16h:15	*16h:30*	**Salle 1**	**Salle 2**
Communications		**C. Boulkheloua**	**A. Ahmima**
		Titre : *Exponential stability of lord shulman thermoelastic system with porous damping and delay term*	**Titre :** *Well posedness and exponential stability of a porous elastic system free of second spectrum*

National seminair on Modern Mathematics & Applications - MMA24

6, 7, et 8 octobre 2024, Université Badji Mokhtar, Annaba, Algérie

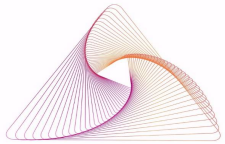
07-oct-24

08h:00	*9h:00*	**Enregistrement**
09h:00	*9h:45*	**Amphi**
Plénières		**N. Bousetila** **Chairman :** *L. Chorfi* **A tutorial on inverse and il-posed problems for anomalous diffusion phenomena**
9h:45	*10h:15*	**Pause café et session de posters**
Posters		**Chaker Randa** *Théorème du point fixe pour les contractions F-faibles sous de nouvelles hypothèses impliquant une fonction \rho* **Azioune Mourad** *Dynamics analysis and chaos control of a bertrand duopoly game* **Mechaouf Abir** *Optimal control problems for hyperbolic evolution equation with long memory* **Grine Razika** *Propriétés du Processus Poisson Lindley Modifiée* **Boustila Ranya** *Pointwice almost complete convergence of functional conditional density estimator under a censorship model* **Benteboula Lemya** *On stochastic dynamical systems under uncertainty* **Meari Manel ElBatoul** *The mean squared convergence of a recursive kernel estimator familly* **Manaa Soumia Asymptotic** *Analysis of an interface problem with nonlinear dissipative term in a dynamic regime* **Lakikza Hanane** *About the two-phase Stefan problem* **Chouia Sarra** *A new extension of Lindley Distribution: Properties And Application* **Sayah Sayah** *Estimating the Inverse Distribution Function at the Boundary* **Talhi Hamida** *Bayesien estimation of A New Mixture of Two Components of Exponentiated Family under different loss functions* **Arioui Fatma Zahra** On some Fractional Stochastic Differential Equations **Keddali Meriem** *Bayesian robust analysis of the truncated XLindley distribution*
10h:15	*11h:15*	**Session de communications orales**

		Chairman : M. S. Chibi	**Chairman** : M. C Bouras
10h:15	*10h:30*	**Salle 1**	**Salle 2**
Communications		**S. Abdelhadi** **Titre :** *Well-posedness of solution for a coupled system of nonlinear wave equations with variable exponents*	**K. Boudehane** **Titre :** *Non markovien petri nets for performance and reliability analysis*
		Chairman : M. S. Chibi	**Chairman** : M. C Bouras
10h:30	*10h:45*	**Salle 1**	**Salle 2**
Communications		**A. Bezai** **Titre :** *The optimal trajectories of Grushin model*	**S. Ben hanachi** **Titre :** *A new nonlinear conjugate gradient method for solving unconstrained optimization problems*
		Chairman : **M. S. Chibi**	**Chairman :** M. C Bouras
10h:45	*11h:00*	**Salle 1**	**Salle 2**
Communications		**A. Boussaha** **Titre :** *Optical soliton-solution of Fokas-Lenis equation*	**D. Guettal** **Titre :** *Utilizing Branch-and-Bound Algorithms to Solve Hölder Nonlinear Systems of Equations and Inequalities*
		Chairman : M. S. Chibi	**Chairman :** M. C Bouras
11h:00	*11h:15*	**F. Si bachir**	**H. Brahim Boulares**
Communications		**Titre :** *Successive Approximations for Caputo-Fabrizio Fractional Differential Equations*	**Titre :** *Boundedness of Pseudo-differential operator on Triebel-Lizorkin-type spaces*

11h:15 *12h:00*	**Amphi**	
Plénières	**Chairman :** *L. Chorfi* **M. Sini** **Ultrasound Tomography using Resonant Perturbations**	
12h:00 *13h:00*	**Session de communications orales**	
	Chairman: S. Mazouzi	**Chairman** : A. Laouar
12h:00 *12h:15*	**Salle 1**	**Salle 2**
Communications	**K. Tahri** **Titre :** *Les équations de type Kirchhoff*	**I. Djebar** **Titre :** *Theory and application of bivariate credibility*
	Chairman : S. Mazouzi	**Chairman** : A. Laouar
12h:15 *12h:30*	**Salle 1**	**Salle 2**
Communications	**D. Zerrouki** **Titre :** *Improved quadratic convex underestimator for univariate nonconvex function*	**A. Taane** **Titre :** *On the generalized bivariate Fibonacci polynomials and some of their new identities*
	Chairman : S. Mazouzi	**Chairman** : A. Laouar
12h:30 *12h:45*	**Salle 1**	**Salle 2**
Communications	**A. Nasri** **Titre :** *Some d-orthogonal polynomials*	**N. Hamel** **Titre :** *Novel conjugate gradient approach with convergence properties*
	Chairman : S. Mazouzi	**Chairman** : A. Laouar
12h:45 *13h:00*	**Salle 1**	**Salle 2**
Communications	**K. Rouibah** **Titre :** *Iterative collocation method for second order Voltera integro differential euations*	**S. Attab** **Titre :** *An iterative differential evolution problem driven by maximal monotone operator*
13h:00 *14h:00*	**Déjeuner**	
14h:00 *15h:00*	**Session de communications orales**	
	Chairman : S. Mazouzi	**Chairman** : A. Laouar
14h:00 *14h:15*	**Salle 1**	**Salle 2**
Communications	**A. Nabti** **Titre :** *Qualitative analysis of age-structured SEIR epidemic model*	**A. Guemoula** **Titre :** *Some Numerical Radius Inequalities for Hilbert Space Operators Using The New Norm On B(H)*
	Chairman : S. Mazouzi	**Chairman** : A. Laouar
14h:15 *14h:30*	**Salle 1**	**Salle 2**
Communications	**S. Benzamouche** **Titre :** *Central limit theorem for the kernel estimator of the relative error regression function for twice censored and dependent data*	**A. Ouani** **Titre :** *Some generalizations of the fixed point theorem*
	Chairman : S. Mazouzi	**Chairman** : A. Laouar
14h:30 *14h:45*	**Salle 1**	**Salle 2**
Communications	**A. Benrabah** **Titre :** *Regularization for an ill-posed fourth order differential-operator equation via a modified quasi-boundary value method*	**S. Teghri** **Titre :** *A Study Of A Novel Lindley-Univariate Frailty Model*

		Chairman : S. Mazouzi	**Chairman** : A. Laouar
14h:45	*15h:00*	**Salle 1**	**Salle 2**
Communications		**F. Saihi** **Titre :** *Karnel estimation of the density function in the presence of associated and twice censored data*	**N. Boumaila** **Titre :** *Mathematical modeling of Algerian rainfall using Periodic restricted EXPAR processes*
15h:00	*15h:30*	**Pause café et séance de posters dans le hall**	
Posters		**Hamami Loubna** The quasi XGamma frailty model with survival analysis **Seghier Fatma Zohra** A new generalization of Poisson distribution: Mathematical properties and Applications **Bounadja Hizia** Decay property of regularity-loss type for solutions in standard linear solid model with Gurtin--Pipkin thermal law **Azouz Zineb** Systèmes-(h,k)-contigus-sur (m,n) : Algorithme de calcul de la borne de fiabilité par la méthode dite des colonnes consécutives **Ezzebsa Abdelali** Regularization of an inverse source degenerate problem for time-space fractional parabolic equations via modified quasi-reversibility method **Didi Hana** Multiple positive solutions for a class of quasi-linear singular elliptic systems **Beghriche Abdelfateh** The Log - Two-parameter family of distributions **Bousseba Fatma Zohra** A new extension of the quadratic exponential distribution **Tabet Achref Eddine** *Limit cycles bifurcating from a zero-hopf equilibrium of a 3-dimensional* **Tair Boutheina** Solving non-linear Cauchy integral equation **Bouslah Zineb** Boundary Integral Equation Method for Solving Navier-Riquier Neumann Boundary Value Problems of the Biharmonic Equation **Kouadria Mohamed** An extended new-XLindley distribution: properties and Application using the luteinizing hormone in blood dataset	
15h:30	*16h:30*	**Session de communications orales**	
		Chairman : H. Saker	**Chairman** : I. Zerrouki
15h:30	*15h:45*	**Salle 1**	**Salle 2**
Communications		**A. Makreloufi** **Titre :** *Linear quadratic optimal control problems governed by rectangular singular systems*	**E. T. Mohammed Chikoune** **Titre :** *On the stochastic differential equation under Non-Lipschitz conditions*
		Chairman : H. Saker	**Chairman** : I. Zerrouki
15h:45	*16h:00*	**Salle 1**	**Salle 2**
Communications		**H. Moussaoui** **Titre :** *2-cocycles on superalgebras*	**A. Boudraa** **Titre :** *Multi-valued Contractions And Coincidence Points Results In Metric Spaces*
		Chairman : H. Saker	**Chairman** : I. Zerrouki
16h:00	*16h:15*	**Salle 1**	**Salle 2**
Communications		**F. Achab** **Titre :** *Bilinear optimal control of pdes with missing data*	**K. Maazouz** **Titre :** *Fractional Differential Value Problem with Variable OrderFractional Differential Value Problem with Variable Order*
		Chairman : H. Saker	**Chairman** : I. Zerrouki
16h:15	*16h:30*	**Salle 1**	**Salle 2**
Communications		**M. Meneceur** **Titre :** *Multivalued almost θ-contractions, related fixed point results in complete b-metric spaces and applications*	**H. Yousfi** **Titre :** *Dynamics and security applications of medical image encryption using the fractional order circulant systems.*



National seminair on Modern Mathematics & Applications - MMA24

6, 7, et 8 octobre 2024, Université Badji Mokhtar, Annaba, Algérie

08-oct-24

09h:00	*10h:00*	**Amphi**
Plénière		**Chairman :** *A. Laouar* — **N. Kechkar** **Numerical approach of some evolution problems for nonlinear PDEs from biology**
11h:00	*11h:40*	**Pause café et session de posters**
Posters		**Bouhadjar Meriem** *New extension of XLindley model: simulations and Applications in epidemiology* **Khélifa Imene** *Inverse problem of determining radialy symmetric potential* **Adnan Jalil** *Chaotic systèmes* **Benhachiche Meriem** *Testing the Mean Ratio forecasts for Chile region* **Haneche Nabil** *Adaptive hybrid synchronization of fractional-order hyperchaotic systems and its application in secure communication* **Amari Nesrine** *Maximum norm analysis of a non-matching grids method for quasi-variational inequality related to impulse control problems* **Said Fatma** *Qualitative study of solutions for certains fractional differential equations and applications* **Bouaoud Safa** *Practical h-stability of perturbed abstract dynamic equations and applications* **Bouaoud Safa** ***P****ractical h-stability of perturbed abstract dynamic equations and applications* **Redouane Kelthoum Lina** An Innovative B-Spline Numerical Method for Solving Nonlinear **Benguessoum Adel** Riemann Type of Fractional Integral Inequalities of (k, s)− via h-Convex **Cheniguer Sara** *Sur les suites des polynômes orthogonaux et les équations différentielles*
10h:15	*11h:15*	**Session de communications orales**
		Chairwoman : S. Saadi — **Chairman** : H.Zaghdoudi
10h:15	*10h:30*	**Salle 1** — **Salle 2**
Communications		**M. Rahal** — **Titre :** *Numerical calculate of multiple integrals over non-rectangular regions via $\alpha $-dense curves* **M. Khaldi** — **Titre :** *A modified Newton-type iteration method for solving a new general absolute value equations*
		Chairwoman : S. Saadi — **Chairman** : H.Zaghdoudi
10h:30	*10h:45*	**Salle 1** — **Salle 2**
Communications		**S. Hamdi** — **Titre :** *A novel stability result for a flexible satellite system with viscoelastic damping under tension effects* **C. Bellamouchi** — **Titre :** *PExistence an uniqueness of positive slution for some nonlocal elliptic problem*
		Chairwoman : S. Saadi — **Chairman** : H.Zaghdoudi
10h:45	*11h:00*	**Salle 1** — **Salle 2**
Communications		**O. Abid Charef** — **Titre :** *Optimal Design of Non-Conventional Dynamical System with Negative Stiffness for Enhanced* **A. Layati**

Communications		**Titre :** *Optimal Design of Non-Conventional Dynamical System with Negative Stiffness for Enhanced Vibration Control of Damped Primary Structures*	**Titre :** *Solution of the semilinear elliptic equation with Hardy-Sobolev exponents with sign changing solutions*
		Chairwoman : S. Saadi	**Chairman** : H.Zaghdoudi
11h:00	*11h:15*	**Salle 1**	**Salle 2**
Communications		**H. Sellami** **Titre :** *The maximum number of limit cycles of a class of three dimensional discontinuous piecewise differential systems separated by cylinders*	**K. Iatime** **Titre :** *Results of some boundary value problem models using different degree methods*
		Chairwoman : S. Saadi	**Chairman** : M. Haiour
11h:15	*11h:30*	**Communication**	**Salle 2**
Communications		**M. Ghelmi** **Titre :** *Limit cycles for piecewise differential systems formed by two arbitrary linear systems and a cubic symmetric system*	**K. Chabane** **Titre :** *Self-adjoint solution of Sylvester equations in Hilbert spaces*
		Chairwoman : S. Saadi	**Chairman** : H.Zaghdoudi
11h:30	*11h:45*	**Salle 1**	**Salle 2**
Communications		**B. Khemici** **Titre :** *Recursive generalized gamma kernel density estimation for nonnegative dependent data*	**B. Elbetch** **Titre :** *Coupled Cooperative Differential System: Example of two-patch model*
		Chairwoman : S. Saadi	**Chairman** : H.Zaghdoudi
11h:45	*12h:00*	**Salle 1**	**Salle 2**
Communications		**B. Laouadi** **Titre :** *nonuniqueness fixed point theorem under rational contractive condition*	**I. Zemmour** **Titre :** *Limit Cycles in Septic Polynomial Differential Systems Arising from the Periodic Annulus of a Cubic Center*
12h:00	*13h:00*	**Déjeuner**	
13h:00	*14h:00*	**Cloture**	