

# KFUPM

## Mathematics & Statistics Department

### Curriculum Vitae



**Dr. Boubaker Smii**

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## 1. Personal Information

**Name:** Boubaker Smii

**Birth date & place:** May, 23 1977, Kasserine (Tunisia)

**Marital Status:** Married with three children

**Address:** King Fahd University of Petroleum and Minerals / Department of Mathematics and Statistics, P. O Box 82/Dhahran 31261 / Saudi Arabia.

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**E-mail:** [boubaker@kfupm.edu.sa](mailto:boubaker@kfupm.edu.sa)

**Function:** Assistant Professor

**Major Field:** Stochastic Analysis

**Area of research interest:** SDEs driven by Lévy noise, Asymptotic expansions of SDEs, Applications of the Graphs to SPDE's driven by Lévy noise, Graph Theory, Stochastic partial differential equations, Mathematical Physics.

## 2. Background

### 2.1. Education

University	Year	Degree Obtained
Bonn University (Germany)	2006	Ph. D. In Math
Tunis ElManar University (Tunisia)	2003	M S. In Math
University of Bizerte (Tunisia)	2001	D.E.S. (BS) In Math.

### 2.2. Scholarships and Honors

**2009-2010:** Scholarship from the German Academic Exchange Service (**DAAD**).

**2006-2007:** Member of the Excellence Cluster, University of Bonn, Germany.

**2004-2006:** Member of the Bonn International graduate student-**BIGS**-Germany.

**2004-2007:** Scholarship from the German Academic Exchange Service (**DAAD**).

## 3. Teaching 3.1. Teaching Experience

University	Period of Service	Position
KFUPM, Dhahran, KSA	2017---now	Associate Professor
KFUPM, Dhahran, KSA	2008 – 2016	Assistant Professor
Aljouf University, Skaka, KSA	2007 – 2008	Assistant Professor
Bonn University, Germany	2006 – 2007	Visiting Assistant Professor
TunisElManar University , Tunisia	2003 – 2004	Teaching Assistant

### 3.2. Courses Taught

#### a. Undergraduate and Graduate Courses:

University	Year	Courses
University of Tunis	2003 – 2004	Analysis 1, Analysis 2, Algebra 1, Algebra 2
University of Bonn	2006 – 2007	Probability
University Aljouf	2007 – 2008	Calculus I, Calculus II, Graph Theory
KFUPM	2008 – 2009	Calculus II (MATH 102)
KFUPM	2009 – 2010	Elements of differential equations (Math202)
KFUPM	2010-2011	Math202, Math 280, Math 102
KFUPM	2011-2012	<b>Stat 416</b> : Stochastic processes for actuaries.
KFUPM	2012-2013	<b>Math 590</b> : Introduction to stochastic

		differential equations and applications.
KFUPM	2013-2014	<b>Math 605</b> : Asymptotic expansion and Perturbation Theory. <b>Math 102</b> : Calculus II
KFUPM	2014-2015	<b>Math 690</b> : Stochastic differential equations and Applications. <b>Math 101</b> : Calculus I
KFUPM	2015-2016	<b>Math 102</b> : Calculus II
KFUPM	2016-2017	<b>Math 601</b> : Stochastic differential equations and applications. <b>Math 102</b> : Calculus II

**b. Graduate course:**

*I developed new graduate course **Math 601” Stochastic differential equations and applications”.***

**4. Research Work**

**4.1. Published and accepted Journal papers & Proceedings:**

- ▶ Explicit invariant measures for infinite dimensional SDE driven by Lévy noise with dissipative nonlinear drift I. To **appear** in **Communications in Mathematical Sciences (2016)**. (with S. Albeverio, L. Dipersio and E. Mastrogiacomo).
- ▶ A Large diffusion Expansion for the Transition Function of Lévy Ornstein-Uhlenbeck Processes, **Appl.Math. Inf.Sci.** 10,No.4, pp. 1-8 (2016).
- ▶ On the representations of the canonical partition function and the Helmotz free energy. To **appear** in **Journal of Comp. and Theor. Nano.** (2016).
- ▶ A class of Lévy driven SDEs and their explicit invariant measures. **Potential analysis.** 45 (2). pp. 229-259 (2016). **DOI:** 10.1007/s11118-016-9544-3. (with S. Albeverio, L. Dipersio and E. Mastrogiacomo).
- ▶ Asymptotic expansions for SDE's with small multiplicative noise. **Stoch. Proc. Appl.** 125 (3) (2015) pp.1009-1031 (with S. Albeverio).
- ▶ Small noise asymptotic expansions for stochastic PDE's driven by dissipative nonlinearity and Lévy noise. **Stoch. Proc. Appl.** 123 (2013) pp. 2084-2109. (with S.Albeverio and E. Mastrogiacomo).
- ▶ Feynman Graph Representation to Stochastic Differential Equations Driven by Lévy noise . Proceeding of the International Conference on Mathematical Sciences and Statistics 2013, Kuala Lumpur., pp. 213-222, **Springer**, IX, 2014.
- ▶ A Linked Cluster Theorem of the solution of the generalized Burger equation., "**Appl. Math. Scien.(Ruse)**, vol. 6, no. 1, pp. 21-38, 2012.

- ▶ The Feynman graph representation of convolution semi-groups and its application to Lévy statistics. **Bernoulli** . 14 (2) **2008**. 322-351 pp(with H. Gottschalk and H. Thaler).
- ▶ How to determine the law of the solution to a SPDE driven by a Lévy space-time noise, **Journal of Mathematical Physics** v.48. Issue 03. **2007**. 1-22 pp(with H. Gottschalk).
- ▶ Convolution calculus on white noise spaces and Feynman graph representation of generalized renormalization flows. **Mathematical Analysis of Random Phenomena. Word Sci.** **2007**, 101-111 pp (with H. Gottschalk and H. Ouerdiane).
- ▶ Integral representation of positive Operator. Stochastic Analysis and Probability, **Tunisia-Japan** Symposium on culture and Science 2005, 51-53 pp (with H. Ouerdiane).

#### 4.2 . Submitted papers:

- ▶ A graphical representation of the truncated moments of a mixed noise, Submitted (**2016**).
- ▶ Asymptotic character of the transition function of of Lévy Ornstein-Uhlenbeck processes. Submitted (**2016**).

#### 4.3. Conference Presentations

- ♪ Boubaker S. “ On the representations of a SPDE driven by a multiplicative Lévy noise.” ALEA in Europe Meeting 2016, Munich-**Germany**, February 22-26, **2016**.
- ♪ Boubaker S. “ Applications of SDEs driven by Lévy noise.” 12-th Workshop on Stochastic Models, Statistics and their Applications , Wroclaw-**Poland**, February 16-20, 2015.
- ♪ Boubaker S. “ Asymptotic expansions of SDEs driven by Lévy noise.” XVI-th International Summer Conference On Probability And Statistics (ISCPS-2014). Pomorie-**Bulgaria**. June 21-28, 2014.
- ♪ Boubaker S. “A Graphical representation of the Itô formula.” International Conference on Mathematical Sciences and Statistics, **Malaysia-Kuala Lumpur** February 5-7th, 2013.
- ♪ Boubaker S. “ SPDE’s and their applications.” 6th International Conference on Stochastic Analysis and Its Applications, Będlewo-**Poland**, September 10-14th, 2012.
- ♪ Boubaker S. “Feynman graph representations to the solution of the SDE driven by Lévy noise”. Stochastic Analysis, Lévy processes and (B) SDEs, 03-07 October, 2011, Innsbruck-**Austria**.
- ♪ Boubaker S. “Application of the generalized Feynman graph to SPDE's driven by Lévy noise.” 34<sup>th</sup> International Conference on Stochastic Analysis and its Applications, 06-10September 2010, Osaka. **Japan**.
- ♪ Boubaker S. “Summability of the solution of the generalized Burger equation”. 6th International Conference on Lévy Processes:Theory and Applications, Dresden-**Germany**, July 26-30, 2010.

♪ Boubaker S. “Graphical solution of the generalized Burger equation”. The first International Conference on Mathematics and Statistics, **Sharja**- UAE, March 18-21, 2010

♪ Boubaker S.” *Applications of the graphs to generalized KPZ equation driven by Lévy noise*”. 33<sup>rd</sup> International Conference on Stochastic Analysis and its Applications, 27-31 July 2009, **Berlin**. Germany.

♪ *Boubaker S. ” Application of the Feynman graphs to Stochastic equations” International Symposium on Global Analysis and Probability, May 27-28, 2008 . Department of Mathematics, Qassim University, Saudi Arabia.*

#### **4.4. Funded Projects:**

<b>Title of the project</b>	<b>Period</b>	<b>Funded by</b>	<b>Role</b>	<b>Status</b>
Asymptotic expansions of SDE's and applications to Lévy driven financial models	Sep. 2015— Mar.2017	KFUPM	PI	In Progress
Invariant measures for stochastic differential equations driven by Lévy noise	May, 2013- October 2014	KFUPM	PI	Completed
Asymptotic expansions for SDE's with small multiplicative noise	June-July 2013	KFUPM (Summer Grant)	PI	Completed
Feynman graph representation of the transition density of the Lévy OU process	January, 2012- July 2013	KFUPM	PI	Completed
A graphical representation of the one dimensional Ito Formula	May, 2011- May 2012	KFUPM	PI	Completed
Summability of the solution of the generalized KPZ equations	Jan. 1st, 10 – Feb, 1st 11	KFUPM	Principal Investigator (PI)	Completed

#### **4.5. Conference Attendance :**

<b>Name</b>	<b>Place</b>	<b>Date</b>
<i>ALEA in Europe Meeting 2016.</i>	<i>Munich-Germany</i>	<i>February 22-26 2016</i>
<i>12-th Workshop on Stochastic Models, Statistics and their Applications ,</i>	<i>Wroclaw-Poland</i>	<i>February 16-20 2015</i>
<i>XVI-th International Summer Conference On Probability And Statistics (ISCPS-2014).</i>	<i>Pomorie-Bulgaria</i>	<i>June 21-28, 2014</i>
<i>International Conference on Mathematical Sciences and Statistics</i>	<i>Malaysia-Kuala Lumpur</i>	<i>February 5-7th, 2013</i>
<i>6th International Conference on Stochastic Analysis and Its Applications</i>	<i>Będlewo-Poland</i>	<i>September 10-14th, 2012</i>
<i>4th Annual IAMCS Spring Symposium, KAUST,</i>	<i>Jeddah, Saudi Arabia</i>	<i>May 6-7,2012</i>
<i>Conference on Stochastic analysis L\`evy processes and (B) SDEs</i>	<i>Innsbruck-Austria</i>	<i>October 3-7, 2011</i>

<i>34th Conference on Stochastic Processes and their Applications</i>	<i>Osaka- Japan</i>	<i>September 6-10, 2010</i>
<i>6th International Conference on Levy Processes: Theory and Applications</i>	<i>Dresden- Germany</i>	<i>July 26-30, 2010</i>
<i>The first International Conference on Mathematics and Statistics</i>	<i>Sharja- UAE, March</i>	<i>March 18-21, 2010</i>
<i>33<sup>rd</sup> Conference on stochastic processes and their applications</i>	<i>Technische Universitat, Berlin. Germany.</i>	<i>july 27-31, 2009</i>
<i>International Symposium on Global Analysis and Probability,</i>	<i>Qassim University, Saudi Arabia.</i>	<i>May 27-28, 2008</i>
<i>International Symposium on Mathematical Methods Applied to the Sciences</i>	<i>San José, Costa Rica</i>	<i>19-22 February, 2008.</i>
<i>International conference on Mathematical Analysis of Random Phenomena.</i>	<i>Hammamet, Tunisia</i>	<i>12-17, 2005</i>
<i>Tunisia-Japan Symposium on culture, Science and Technology</i>	<i>Sfax, Tunisia</i>	<i>May 23-29, 2004</i>
<i>International conference on Mathematical Analysis and Probability,</i>	<i>Hammamet, Tunisia.</i>	<i>October 20-25, 2003</i>

\* **Refereed Reports:**

► **Smii. B.** Feynman Graph Representation of the transition density of the Lévy Ornstein-Uhlenbeck Process. Final report, KFUPM, Project IN111009, **April 2014.**

► **Smii. B.** Invariant measures for stochastic differential equations driven by Lévy noise. Final report, KFUPM, Project IN121060, (with S. Albeverio), **March 2016.**

► **Smii. B.** A graphical representation of the one dimensional Ito Formula. Final report, KFUPM, Project IN101025, November 2012.

**4.6 Books :**

1) *Application of generalized Feynman graph to SPDE driven by Lévy noise. In Progress, Dhahran 2015.*

**4.7. International collaborations:**

- 1-Prof. Sergio Albeverio, from the University of Bonn, Germany since 2003 until now.
- 2-Prof. Ernst Eberlein, from Freiburg University , Germany during 2014.
- 3-Prof. Dennis Sullivan, from Stony Brook University, USA during March 2013.

## 5. Visits / Seminars

5.1. \* Attending the weekly department Colloquium with one presentation, at least, each year.

### 5.2. Seminars outside Department

Date	Title	Location
21 / 07/ 2009	Application of the graphs to burger equation driven by non Gaussian noise	University of Koblenz, Germany

### 5.3. Visits

University	Location	Period of visit
University of Bonn, Germany	Bonn, Germany	June-July 2013
University of Bonn	Bonn, Germany	Two weeks (2013), two weeks (2012), two weeks (2011), two months (2009).
University of Dresden	Dresden, Germany	1 Week , Summer 2010
Technische Universitat	Berlin, Germany	Two weeks, Summer 2009
University of Koblenz	Koblenz, Germany	Three months, Summer 2009
Max Planck Institute	Bonn, Germany	Summers 2006 & 2007
University of Bielefield	Germany	1 week , Summer 2006

### 5.4. Short courses & Workshops Attended :

Date	Activity	Place
Summer 2006	Short course in Unix	Germany
Summer 2009	Short course in Financial Mathematics	Koblenz, Germany

## 6. Committees

2012-2013	Research Committee (member) Applied Math group (member) Graduate Committee (Revision program )
2010-2011	Applied Math Group (Member) Coordination Group (Member) Math-Olympiad Group(Member) hoc committees: Under-graduate program (Member)
2009-2010	Applied Math Group (Member) Combinatorics Group (Member) Awarness Committee (Member)

## 7. Languages

Arabic – English – French and German

## 8. Hobby

♣Leisure: Travel, reading

♣Sports: walking, Football , Kung Fu, Taekwondo, swimming

