

SÉMINAIRE DE MATHÉMATIQUES ACTUARIELLES ET FINANCIÈRES

organisé par Quantact, le Laboratoire de mathématiques actuarielles et financières du CRM

PLT-2548

1065, avenue de la Médecine, Québec
Pavillon Adrien-Pouliot, Université Laval

24 avril 2015, 14:00-16:30

Ronnie Loeffen

School of Mathematics, University of Manchester, Angleterre
Spectral representations for CBI processes and applications

Based on the work of Ogura (1974/75) we provide a discrete spectral representation of the semi-group of continuous state branching processes with immigration (CBI). CBI processes are used in various areas of mathematical finance, where they are referred to as positive, one-dimensional affine processes. We show how these eigenfunction expansions lead to a very fast method for pricing bond options in an affine short rate model. Further, we discuss how they can be used to derive smoothness properties of the semi-group. This is joint work with Marie Chazal and Pierre Patie.

Juan Carlos Pardo Millán

Centro de Investigación en Matemáticas A.C. , Mexique

The excursion measure away from zero of a spectrally negative Lévy processes and its application to bankruptcy models.

During the first part of the talk, we will briefly discuss excursion theory away from zero for spectrally negative Lévy processes. In particular, we are interested in computing explicitly the entrance law of the so-called canonical excursion. This object is important for the description of some fluctuations identities that can be applied to different areas of applied probability. We will start with the simple case when the Levy process has bounded variation paths (which includes the Cramer-Lunberg model) and then we will explain the difficulties that appear in the unbounded variation case (for instance Cramer-Lunberg model with a Brownian component). In the second part of the talk, we present a bankruptcy model where the surplus process is driven by a spectrally negative Lévy process. In this bankruptcy model, a company will be out of business once a negative excursion of the surplus process is below a certain level which can be random. In other words, we associate an independent random variable to each negative excursion of the surplus process that represents the limit of debt that the company can afford once the surplus of the company is negative and once a negative excursion is below this level we say that bankruptcy occurs or that the company is declared insolvent. We are interested in the Gerber-Shiu functional associated to this model at time to bankruptcy. Our techniques are based on the excursion theory away from zero of the surplus process. This is a joint work with J. L. Perez and V. Rivero

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April 24 2015, 14:00-16:30

Ronnie Loeffen

School of Mathematics, University of Manchester, England
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