Title: Ornstein-Uhlenbeck Process in Non-life Insurance: The Beauty and the Beast

Abstract:
One of the most popular risk measures in non-life insurance mathematics is the value of expected discounted dividends. One assumes that a high present value of future dividends indicates a more stable and higher quality business.

We consider several settings in non-life insurance involving an Ornstein-Uhlenbeck (OU) process - as an interest rate or as a surplus process.
The target is to find a strategy that maximises the value of expected discounted dividends.
An OU process, despite being a well-investigated diffusion, considerably complicates the derivations. Differently than for an arithmetic Brownian motion as a surplus or a geometric Brownian motion as a discounting factor, the differential equations describing the return functions of a particular strategy in case of an OU lead to solutions involving parabolic cylinder functions. Therefore, the verification theorem becomes hard to prove.

In this talk, we discuss several examples revealing some advantages and disadvantages of models involving OU processes.