



**SÉMINAIRE**

# **VAR-CONSTRAINED CHOQUET-WASSERSTEIN P- BOX APPROXIMATION FOR ROBUST STOP-LOSS REINSURANCE SELECTION**

**12 décembre 2025**  
**Salle Maurice Desplas**  
**4 rue Blaise Desgoffes 75006 Paris**

The next [LEMMA](#) seminar will host [Davide Perutti](#) from Sapienza University.

Guillaume will present "VaR-constrained Choquet-Wasserstein  $p$ -box approximation for robust stop-loss reinsurance selection"

*Abstract : We consider a robust version of the optimal retention selection in a stop-loss reinsurance contract under ambiguity. Taking Dempster-Shafer theory as the reference uncertainty calculus, it is known that probability distortions can show the so-called dilation phenomenon. This last fact particularly affects robust quantile-type risk measures and may produce overestimations of capital requirements. For this reason, we face the approximation of an arbitrary belief function in Dempster-Shafer theory, seen as the imprecise distribution of a random loss, with a suitable pair of lower-upper cumulative distribution functions (also called a  $p$ -box). The quoted  $p$ -box is asked to minimize a Choquet-Wasserstein pseudo-distance while satisfying inequality constraints on the corresponding lower-upper quantile functions. We show that the computation of the approximating  $p$ -box can be carried out efficiently through a generalization of the Dykstra's algorithm by relying on a proper entropic formulation. We apply the described approximation to the initial reinsurance problem, which is formulated via the minimization*



*of the pessimistic VaR of the pessimistic total loss of the insurer. We derive a characterization of the robust optimal retention level and envisage related hierarchical games under ambiguity between the reinsurer and the insurer.*