# Optimal reinsurance strategy in two dimensional risk model

*Wei Wei*, University of Waterloo, Canada

It is well known that, when considering one single risk, the stop loss reinsurance strategy minimizes the ruin probability or maximizes the adjustment coefficient of the surplus process for the first insurer in compound Poisson model. Instead of considering one single risk, we study optimal reinsurance strategy regarding two-dimensional risk in this paper. We prove that under certain dependence structure, the stop loss strategy preserve its optimality in minimizing ruin probability. On the other hand, we also prove from a new approach that stop loss reinsurance strategy maximizes the adjustment coefficient provided it is well defined. Different from single risk case, the optimal strategy for our model turns out to be a two-dimensional stop loss reinsurance strategy with two retention levels to be determined. We further find out the optimal retention levels under the constraint of fixed reinsurance premium assumption.