

# When the POT–approach fails: super heavy tailed distributions and covariate information

by U. Cormann (speaker) and R.–D. Reiss,  
University of Siegen

**Abstract.** We consider the case that the conditional distribution of a random variable  $Y$  given  $X = x$  is in the domain of attraction of a generalized Pareto distribution (GPD), which parameters depend on  $x$ . In many cases this entails that the distribution of  $Y$  is not in the domain of attraction of any GPD anymore. We distinguish two cases whether the covariate variable  $X$  can be observed or not.

Considering the first case we propose a conditional point process model to estimate the tail of the conditional distribution via Maximum–Likelihood. In the second case we derive limiting distribution of exceedances from super–heavy tailed distributions using non–linear transformations.

Finally some open questions are addressed concerning threshold selection in the first case and discriminating between heavy and super–heavy tailed distributions in the second case.