

R Package potomax: Overview

Yves Deville

`r Sys.Date()`

The potomax package

The **potomax** package is devoted to the estimation and inference of the Poisson-GP model in Extreme-Value Analysis. This model marked Poisson process indexed by time with the marks distributed according to the Generalised Pareto (GP) distribution.

If **Renext** package. As is the case with **Renext**, the package allows the use of observations aggregated in time. These involve standard block maxima, but also *historical information*.

It has several differences with **Renext**

- Profile-likelihood inference.
-

Profile-likelihood

Profile-likelihood is used to infer on the parameters, be they in the Poisson-GP or in the NHPP parameterisation, and also on the return levels.

As in the **NSGEV** package the profile-likelihood confidence intervals are computed using constrained optimisations.

Using exponential POT excesses

From version 0.2.0, it is possible to use the exponential distribution as the distribution of the excesses, implying Gumbel maxima over time intervals. This is simply achieved by using the formal argument **distName** with the value "exp1", the default GPD corresponding to "GPD2". In this case the vector of parameters is $[\lambda, \sigma]$ (**rate** and **scale**) for the Poisson-GP parameterisation, and $[\mu^*, \sigma^*]$ (**loc** and **scale**) for the NHPP parameterisation.