Wrapped Cauchy

Parametrisation

The wrapped Cauchy distribution has density

$$f(y) = \frac{1}{2\pi} \frac{1 - (s\rho)^2}{1 + (s\rho)^2 - 2(s\rho)\cos(y - \mu)}$$

for continuously responses y where $|y| \leq \pi$ and $|\mu| \leq \pi$. Here,

μ is a measure of location,

ρ is a measure of the precision ($0 < \rho < 1$),

s is a fixed scaling ($0 < s \leq 1$).

Link-function

The "mean" of y is given as μ and the mean is linked to the linear predictor as

$$\mu = 2\arctan(\eta)$$

(Link function "tan")

Hyperparameters

The "precision" ρ is represented as

$$\rho = \frac{\exp(\theta)}{1 + \exp(\theta)}$$

and the prior is defined on θ.

Specification

- `family="wrappedcauchy"`
- Required arguments: y and s (argument `scale`).

The scalings have default value 1.

Hyperparameter spesification and default values

doc `The wrapped Cauchy likelihoood`

hyper

theta

hyperid `68001`
name `log precision parameter`
short.name `prec`
output.name `Precision parameter for the Wrapped Cauchy observations`
output.name.intern `Log precision parameter for the Wrapped Cauchy observations`
initial `2`
fixed `FALSE`
prior `loggamma`

param `1 0.005`
to.theta `function(x) log(x / (1 - x))`
from.theta `function(x) exp(x) / (1 + exp(x))`

survival `FALSE`

discrete `FALSE`

link `default tan`

pdf `wrapped-cauchy`

status `disabled`

Example

In the following example we estimate the parameters in a simulated example with wrapped Cauchy responses.

Notes

This likelihood is currently disabled.