

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 likelihood

`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 tan.pi

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.