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.