Skew-Normal

Parametrisation

The Skew-Normal distribution is

$$f(y) = 2\frac{\sqrt{w\tau}}{\sqrt{2\pi}} \exp\left(-\frac{1}{2} w\tau \left(y-\mu\right)^2\right) \Phi(a\left[w\tau\left(y-\mu\right)\right])$$

for continuously responses y where $\Phi(\cdot)$ is the cummulative distribution function for a standard Normal, and

μ**:** is the the location parameter

τ**:** is the inverse scale

w**:** is a fixed weight, $w > 0$,

a**:** is the skewness parameter

Link-function

The location parameter is linked to the linear predictor by

$$\mu = \eta$$

Hyperparameters

The inverse scale is represented as

$$\theta_1 = \log \tau$$

and the prior is defined on θ_1.

The skewness parameter is

$$\theta_2 = a$$

and the prior is defined on θ_2.

Specification

- family = `sn`
- Required arguments: y and w (keyword `weights`)

The weights has default value 1.

Example

This is a simulated example requiring the package `sn`.

```
library(sn)

n = 1000
z = rnorm(n)

## data is SN...
y = z + rsn(n, shape = 3)
```

```
formula = y ~ z
r = inla(formula, family = "sn", data = data.frame(z,y),
         verbose=TRUE, keep=TRUE)
summary(r)
```

Notes

None.