

## Linkmodel: sn (EXPERIMENTAL)

### Parametrization

This is the link that map  $p \in (0, 1)$  into  $x \in \Re$ , where

$$F_a(x) = p$$

and  $F_a$  is the cummulative distribution function for the skew-normal distribution,

$$2\phi(x)\Phi(a^{1/3}x)$$

which is renormalized to have zero mean and unit variance (expression omitted).

### Hyperparameters

The parameter  $a$  represented using the (standarized) skewness  $s$  (expression omitted) where

$$s = s_{\max} \left( 2 \frac{\exp(\theta)}{1 + \exp(\theta)} - 1 \right)$$

$s_{\max} = 0.988$ , and the prior is defined on  $\theta$ . There is a PC prior available for  $\theta$ . The PC-prior is corrected for this bound, whereas the pc-prior in the R-functions `inla.pc.{r,p,q,d}sn` does not define a such bound (but use the bound defined by the Skew-Normal itself, 0.99527...).

### Specification

Use `model="sn"` within `control.link`.

### Hyperparameter spesification and default values

**doc** Skew-normal link

**hyper**

**theta1**

**hyperid** 49031

**name** skew

**short.name** skew

**initial** 0.00123456789

**fixed** FALSE

**prior** pc.sn

**param** 10

**to.theta** function(x, skew.max = 0.988) log((1 + x / skew.max) / (1 - x / skew.max))

**from.theta** function(x, skew.max = 0.988) skew.max \* (2 \* exp(x) / (1 + exp(x)) - 1)

**theta2**

**hyperid** 49032

**name** intercept

**short.name** intercept

**initial** 0

**fixed** FALSE

**prior** linksnintercept

```
param 0 0
to.theta function(x) log(x / (1 - x))
from.theta function(x) exp(x) / (1 + exp(x))
```

pdf linksn

## Example

## Notes

- The link-function is also available as R-functions `inla.link.sn` and `inla.link.invsn`
- This link-model is experimental for the moment.
- Setting the initial value for the hyperparameter “intercept” to infinity, will remove the intercept from the link-model.