

## Linkmodel: sn

### 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.

### Hyperparameters

The parameter  $a$  represented as

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

and the prior is defined on  $\theta$ . There is a PC prior available for  $\theta$ . The (absolute) bound of  $a_{\max} = 3.2^3 = 32.768$ , is there for for stability reasons<sup>1</sup>. The PC-prior will be 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.

### Specification

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

### Hyperparameter spesification and default values

**doc** Skew-normal link

**hyper**

**theta**

**hyperid** 49031

**name** alpha

**short.name** alpha

**initial** 0

**fixed** TRUE

**prior** pc.sn

**param** 50

**to.theta** function(x, amax3 = 3.2^3) log((1+x/amax3)/(1-x/amax3))

**from.theta** function(x, amax3 = 3.2^3) amax3\*(2\*exp(x)/(1+exp(x))-1)

**status** experimental

**pdf** linksn

### Example

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<sup>1</sup>This constant is defined as `LINK.SN.AMAX` in the file `inla.h`.

## 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.