Prior for the intercept in the skew-normal link

Parametrisation

The skew-normal link parameterise the intercept implicitly through the quantile level q as a function of the skewness, which for zero skewness equals the normal intercept in the probit link,

$$\mu = \Phi^{-1}(q). \tag{1}$$

Further the quantile level q is represented by

$$q = \frac{\exp(\theta)}{1 + \exp(\theta)} \tag{2}$$

for the (internal) hyperparameter θ. The `linksnintercept` prior is the implied prior for θ when μ is Normal with a given mean and precision.

Note that zero precision is interpreted that the Normal density is uniform with unit density.

Specification

```
..., prior="linksnintercept", param=c(<mean>, <precision>),...
```

Example

This example just shows that the implied prior for the intercept is the same for probit and snlink.

```
n = 200
Ntrials = 200
x = rnorm(n, sd = 0.5)
eta = x
skew <- 0.0
prob = inla.link.invsn(eta, skew = skew, intercept = 0.75)
y = rbinom(n, size = Ntrials,  prob = prob)

r = inla(y ~ 1 + x,
        family = "binomial",
        data = data.frame(y, x),
        Ntrials = Ntrials,
        control.fixed = list(remove.names = "(Intercept)",
                            prec = 1),
        control.family = list(
            control.link = list(
                model = "sn",
                hyper = list(
                    skew = list(initial = 0,
                            fixed = TRUE),
                    intercept = list(param = c(0, 1))))))

rr = inla(y ~ 1 + x,
        family = "binomial",
        data = data.frame(y, x),
        Ntrials = Ntrials,
        control.fixed = list(prec = 1, prec.intercept = 1),
        control.family = list(
```

```
        control.link = list(
            model = "probit")),
    verbose = TRUE)
```

`r$mlik - rr$mlik`

Notes

This is the default prior for the intercept in the skew-normal link.