

## Gaussian prior

### Parametrisation

The normal/Gaussian distribution has density

$$\pi(\theta) = \left(\frac{\tau}{2\pi}\right)^{1/2} \exp\left(-\frac{\tau}{2}(\theta - \mu)^2\right) \quad (1)$$

for continuous  $\theta$  where

$\mu$ : is the mean

$\tau$ : is precision.

### Specification

The Gaussian prior for the hyperparameters is specified inside the `f()` function as following using the old style

```
f( <whatever> , prior="normal", param=c(<mean>, <precision>) )
```

```
f( <whatever> , prior="gaussian", param=c(<mean>, <precision>) )
```

or better, using the new style

```
f( <whatever> , hyper = list(<theta> = list(prior="gaussian", param=c(<mean>, <precision>))) )
```

Similar if there are more than one hyperparameter for that particular `f`-model. In the case where we want to specify the prior for the hyperparameter of an observation model, for example the negative Binomial, the the prior spesification will appear inside the `control.family()`-argument; see the following example for illustration.

### Example

```
n = 10
y = rnorm(n)
r = inla(y ~ 1, data = data.frame(y),
        control.family = list(
          hyper = list(
            prec = list(
              prior = "normal",
              param = c(0, 1)
            )
          )
        )
)
```

### Notes

None.