

## PC prior for precision

### Parametrization

The PC prior for the log-precision  $x$  has density

$$\pi(x) = \frac{\theta}{2} \exp \left( -\theta \exp \left( -\frac{x}{2} \right) - \frac{x}{2} \right) \quad (1)$$

for  $\theta > 0$  where

$$\theta = -\frac{\ln(\alpha)}{u}$$

and  $(u, \alpha)$  are the parameters to this prior The interpretation of  $(u, \alpha)$  is that

$$\text{Prob}(\sigma > u) = \alpha, \quad u > 0, \quad 0 < \alpha < 1,$$

where the standard deviation is  $\sigma = 1/\sqrt{\exp(x)}$ .

### Specification

This prior for the hyperparameters is specified inside the `hyper`-specification, as

```
hyper = list(<theta> = list(prior="pc.prec", param=c(<u>,<alpha>)))
```

### Example

#### Notes

See also functions `inla.pc.{d,p,q,r}prec`