PC prior for α in the Weibull likelihood

Parametrization

The PC prior for the α parameter in the Weibull likelihood, has

$$\text{KLD}(\alpha) = (\Gamma((1+\alpha)/\alpha)\alpha + \alpha\log(\alpha) - \alpha\gamma + \gamma - \alpha)/\alpha$$

where $\gamma = 0.5772156649...$ is Euler's constant. The base-model is $\alpha = 1$, and the expression for the prior follow from

$$d(\alpha) = \sqrt{2\text{KLD}(\alpha)}$$

and

$$\pi(\alpha) = \frac{\lambda}{2}\exp(-\lambda d(\alpha))\left|\frac{\partial d(\alpha)}{\partial \alpha}\right|$$

for $\lambda > 0$ and $\alpha > 0$. The density, cumulative distribution function, quantile function, and a random number generator for this distribution are implemented in the `inla.pc.{d,p,q,r}alphaw` functions. Internally, R-INLA uses $\theta = \log(\alpha)$ rather than α, and the prior for θ follows accordingly.

Specification

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

```
hyper = list(<theta> = list(prior="pc.alphaw", param= <lambda>))
```

Example

Notes

- The default value is $\lambda = 5$.

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