Package 'nakagami'

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Type Package

Title Functions for the Nakagami Distribution

Version 1.1.0

Description Density, distribution function, quantile function and random generation for the Nakagami distribution of Nakagami (1960) <doi:10.1016/B978-0-08-009306-2.50005-4>.

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Encoding UTF-8

Imports assertthat

Suggests testthat, knitr, covr, rmarkdown

RoxygenNote 7.1.1

URL https://github.com/JonasMoss/nakagami

BugReports https://github.com/JonasMoss/nakagami/issues

NeedsCompilation no

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R topics documented:

Nakagami *The Nakagami Density*

Description

Density, distribution function, quantile function and random generation for the Nakagami distribution with parameters `shape` and `scale`.

Usage

```
dnaka(x, shape, scale, log = FALSE)

pnaka(q, shape, scale, lower.tail = TRUE, log.p = FALSE)

qnaka(p, shape, scale, lower.tail = TRUE, log.p = FALSE)

rnaka(n, shape, scale)
```

Arguments

`x, q`	vector of quantiles.
`shape`	vector of positive shape parameters.
`scale`	vector of positive scale parameters.
`log, log.p`	logical; if `TRUE`, probabilities `p` are given as `log(p)`.
`lower.tail`	logical; if `TRUE` (default), probabilities are $P[X \leq x]$ otherwise, $P[X > x]$.
`p`	vector of probabilities.
`n`	number of observations. If `length(n) > 1`, the length is taken to be the number required.

Details

The Nakagami distribution (Nakagami, 1960) with shape m and scale Ω has density

$$2m^m/\Gamma(m)\Omega^m x^(2m-1)e^(-m/\Omega x^2)$$

for $x \geq 0$, $m > 0$ and $\Omega > 0$.

If Y is Gamma distributed with $shape = m$ and $rate = m/\Omega$ then $X = \sqrt{Y}$ is Nakagami distributed with $shape = m$ and $scale = \Omega$.

Sometimes, specifically in radio channels modeling, the parameter m is constrained to $m \geq 1/2$, but the density is defined for any $m > 0$ (Kolar et al., 2004).

Value

dnaka gives the density, pnaka gives the distribution function, qnaka gives the quantile function and rnaka generates random deviates.

The length of the result is determined by n for rnaka, and is the maximum of the lengths of the numerical arguments for the other functions.

The numerical arguments other than n are recycled to the length of the result.

References

Nakagami, N. 1960. "The M-Distribution, a General Formula of Intensity of Rapid Fading." In Statistical Methods in Radio Wave Propagation: Proceedings of a Symposium Held at the University of California, edited by William C. Hoffman, 3-36. Permagon Press.

Kolar, R., Jirik, R., & Jan, J. (2004). Estimator comparison of the Nakagami-m parameter and its application in echocardiography. Radioengineering, 13(1), 8-12.

See Also

The Gamma distribution is closed related to the Nakgami distribution.

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suppress_olw *Suppress object length incompatibility warnings*

Description

Suppress object length incompatibility warnings

Usage

```
suppress_olw(expr)
```

Arguments

expr	expression to be evaluated.

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