Package ‘vMF’

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Description
CpvMF returns the normalization constant of von Mises - Fisher density.

Usage
CpvMF(p, k)

Arguments
- p : as sphere dimension.
- k : as the intensity parameter.

Details
The probability density function of the von Mises - Fisher distribution is defined by:

\[ f(z|\theta) = C_p(|\theta|) \exp(z\theta) \]

|\theta| is the intensity parameter and \( \frac{\theta}{|\theta|} \) the mean directional parameter. The normalization constant \( C_p() \) depends on the Bessel function of the first kind. See more details here.

Value
the normalization constant.

References


See Also
rvMF and dvMF

Examples
CpvMF(2, 3.1)
**dvMF**

PDF of the von Mises - Fisher distribution.

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**Description**

dvMF computes the density of the von Mises - Fisher distribution, given a set of spherical coordinates and the distribution parameters.

**Usage**

dvMF(z, theta)

**Arguments**

- **z** as the set of points at which the spherical coordinate will be evaluated. z may be an one row matrix or vector if it contain one spherical coordinates or a matrix whose each row is one spherical coordinates.
- **theta** as the distribution parameter.

**Details**

The probability density function of the von Mises - Fisher distribution is defined by:

\[ f(z|\theta) = C_p(\theta) \exp(z\theta) \]

|\theta| is the intensity parameter and \(\frac{\theta}{|\theta|}\) the mean directional parameter. The normalization constant \(C_p()\) depends on the Bessel function of the first kind. See more details here.

**Value**

the densities computed at each point

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**References**


**See Also**

rvMF and CpvMF
Examples

{}  
# Draw 1000 vectors from vM-F with parameter 1, (1,0)
z <- rvMF(1000,c(1,0))

# Compute the density at these points
dvMF(z,c(1,0))

# Density of (0,1,0,0) with the parameter 3, (0,1,0,0)
dvMF(c(0,1,0,0),c(0,3,0,0))

rvMF

Sample from von Mises - Fisher distribution.

Description

rvMF returns random draws from von Mises - Fisher distribution.

Usage

rvMF(size, theta)

Arguments

size as the number of draws needed.
theta as the distribution parameter.

Details

The parameter theta is such that \( \text{dim}(\theta) \) is the sphere dimension, \(|\theta|\) the intensity parameter and \( \frac{\theta}{|\theta|} \) the mean directional parameter.

Value

A matrix whose each row is a random draw from the distribution.

References


Examples

# Draw 1000 vectors from vM-F with parameter 1, (1,0)
rvMF(1000, c(1,0))

# Draw 10 vectors from vM-F with parameter sqrt(14), (2,1,3)
rvMF(10, c(2,1,3))

# Draw from the vMF distribution with mean direction proportional to c(1, -1) and concentration parameter 3
rvMF(10, 3 * c(1, -1) / sqrt(2))
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