

# Package ‘FracSim’

April 17, 2009

**Type** Package

**Title** Simulation of Lévy motions

**Version** 0.3

**Date** 2005-11-08

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**Encoding** latin1

**Description** The functions provided in FracSim perform simulation of one- and two-dimensional fractional and multifractional Lévy motions

**License** GPL (>= 2)

**Repository** CRAN

**Date/Publication** 2009-03-10 19:23:26

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fracsim.1d

*Simulation of 1D fractional and multifractional Lévy motions*


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## Description

The function simulates 1D fractional and multifractional motions

## Usage

```
fracsim.1d(h, n, k, m = 1)
```

## Arguments

h	Regularity function. One value for fractional motions; either a function or a vector of length k for multifractional ones
n	Number of terms in the serie
k	Either the vector of discretisation points or the number of discretisation points (calculated equally spaced)
m	Mass term, usually set equal to 1

## Value

t	k-vector of discretization points
simul.h	Vector of simulated regularity values
process	k-vector which elements are the process value at each discretization point

## Author(s)

Sébastien Déjean & Serge Cohen

## References

<http://www.lsp.ups-tlse.fr/FracSim>

## See Also

[fracsim.2d](#)

## Examples

```
library(FracSim)
# Fractional process
X05 = fracsim.1d(h=0.5,k=1000,n=5000)
plot(X05$t,X05$process,type="l")
# Multifractional process
# h is a k-vector
Hsin = 0.25+0.25*sin(seq(0,1,length=1000)*(6*pi))
```

```

Xsin = fracsim.1d(h=Hsin,k=1000,n=5000)
plot(Xsin$t,Xsin$process,type="l")
sint=function(x){0.5+0.5*sin(6*pi*x)}
# h is a function
Xsin2=fracsim.1d(sint,1000,500,1)
par(mfrow=c(2,1))
plot(Xsin2$t,Xsin2$simul.h,type="l")
plot(Xsin2$t,Xsin2$process,type="l")
par(mfrow=c(1,1))

```

fracsim.2d

*Simulation of 2D fractional and multifractional Lévy motions***Description**

The function simulates 2D fractional and multifractional motions

**Usage**

```
fracsim.2d(h, n, kx, ky = kx, m = 1)
```

**Arguments**

h	Regularity function. One value for fractional motions; either a function or a $kx \times ky$ -matrix for multifractional ones
n	Number of terms in the serie
kx	Either the vector of row discretisation points or the number of points (calculated equally spaced)
ky	Either the vector of column discretisation points or the number of points (calculated equally spaced)
m	Mass term, usually set equal to 1

**Value**

X	kx-vector of row discretization points
Y	ky-vector of column discretization points
simul.h	Matrix of imulated regularity values
process	$kx \times ky$ -matrix which elements are the process value at each discretization point

**Author(s)**

Sébastien Déjean & Serge Cohen

**References**

<http://www.lsp.ups-tlse.fr/FracSim>

**See Also**[fracsim.1d](#)**Examples**

```
library(FracSim)
X05.2d = fracsim.2d(h=0.5, kx=100, n=10000)
persp(X05.2d$process)
```

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