The FracSim Package

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Type Package

Title Simulation of Lévy motions

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

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R topics documented:

`fracsim.1d` *Simulation of 1D fractional and multifractional Lévy motions*

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

Details

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

Note

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*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

Details

Value

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

Note

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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