

Schneider, W. R.

Fractional diffusion. (English) [Zbl 0721.60086](#)

Dynamics and stochastic processes. Theory and applications, Proc. Workshop, Lisbon/Port. 1988, Lect. Notes Phys. 355, 276-286 (1990).

Summary: [For the entire collection see [Zbl 0713.00021](#).]

Loosely speaking, the fractional diffusion equation is obtained by replacing the first order time derivative in the diffusion equation by a derivative of order α with $0 < \alpha \leq 1$. A precise definition is obtained by using integrals instead of derivatives. This has the additional advantage of taking the initial condition automatically into account. The Green function for the fractional diffusion equation is obtained in closed form and its properties are exhibited. Finally, a stochastic process called grey Brownian motion is constructed based on a probability measure called grey noise. Its relation to fractional diffusion is the same as the one of ordinary Brownian motion to ordinary diffusion.

MSC:

[60J60](#) Diffusion processes

[46F99](#) Distributions, generalized functions, distribution spaces

[35M99](#) Partial differential equations of mixed type and mixed-type systems of partial differential equations

Cited in **5** Documents

Keywords:

[fractional diffusion equation](#); [Green function for the fractional diffusion equation](#); [grey noise](#)