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Generalized diffusion equation and analytical expressions to neutron scattering experiments

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Abstract

An integro-differential diffusion equation with linear force, based on the continuous time random walk model, is considered. The equation generalizes the ordinary and fractional diffusion equations. Analytical expressions related to neutron scattering experiments are presented and analyzed, which can be used to describe, for instance, biological systems.

Key words: Continuous time random walk, integro-differential diffusion equation, anomalous diffusion processes, harmonic trap; biological systems

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1 Introduction

Recently, neutron sources have been successfully applied to probe the structures and motions of molecules in soft materials, especially for biological materials rich in hydrogen [1]. Neutron scattering technique has been employed to

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