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How to recognize if any absorption occurs in a subdiffusive medium

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Various kinds of diffusion in membrane systems commonly occur in biology (see, for example, \cite{h} and references cited in \cite{k1}). The example of diffusion in a composite system is diffusion of drugs through biofilms in which subdiffusion can be present \cite{awdk}. We consider subdiffusion in a system which consists of two different media separated by a thin membrane. In one of the media particles' absorption can occur. Such systems can be studied experimentally but, due to technical reasons, it is not always possible to measure concentration profiles in the medium in which absorption can be present. For example, when we study the process experimentally by means of the laser interferometric method \cite{awdk} and one of the media in which absorption can occur is opaque. We show the method which allows one to recognize whether absorption is present in such a medium knowing concentration profiles of diffusing substance in the other medium \cite{klk}. This method is based on a simple random walk with absorption model in a membrane system. Within this model we firstly consider particles' transport in a system with both discrete time and space variable. Next, we move to continuous variables. Similar models have been used in modelling diffusion in a membrane system \cite{k1,k2,k3}, to derivation of parabolic \cite{kl} and hiperbolic \cite{k4} subdiffusion–reaction equation, in modelling subdiffusion–absorption process in a membrane system \cite{kl1} and in the description of subdiffusion–absorption process in a composite medium \cite{k5}. Furthermore, the presented method also allows one to determine subdiffusion parameter in the medium which cannot be studied experimentally, for the system without absorption.

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