

## On the Development of a Mathematical Model of Nonequilibrium Filtration

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In this paper, fundamentally new approaches to the modeling of fluid filtration processes in a porous medium are considered, taking into account mass-exchange processes:

- A mathematical model of fluid filtration in a porous medium with allowance for mass exchange processes was developed, and also with the help of limit transitions it was shown that the mathematical problem represents a problem of the Stefan type; the presence of a transition zone adequately reflects the features of physical processes; from a mathematical point of view, the theoretical premises are rigorously mathematically proven;
- For the numerical realization of the problems of filtration theory, the Wavelet-Galerkin method is applied.

## Smart Campuses: A Review of the Current State and Analysis of the Directions of Development

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Nowadays, a very common word is smart campus. The wide development and introduction of ICT in all spheres of life could not leave the sphere of education without attention. This article is devoted to a review of the modern state of modern smart buildings. The paper discusses new directions in the development of academic buildings, their advantages and disadvantages.

Mathematical models of adaptive control systems of educational buildings are given, their technical characteristics, such as power consumption, security,

provision of authorized access to the data warehouse, cloud technologies, SCADA systems, etc.

There are many examples of the introduction of these new technologies in the world's leading universities. An estimation of the economic efficiency of implementation and the payback period of the project is given. A comparative analysis of the existing new technologies is done.

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