MICHIGAN STATE UNIVERSITY
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A Workshop on Future Directions in Fractional Calculus Research and Applications

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Recent Advantages and Open Issues in Anomalous Diffusion Models and Its Numerical Methods

Abstract

This report firstly introduces a new concept named as structure derivative to characterize ultraslow diffusion, in which the basic concept and potential applications are briefly presented. Secondly, a discussion of mathematical models on how to describe time or space dependent solute transport is given. Thirdly, two numerical approaches include implicit calculus method and semi-discrete Kansa scheme, are employed to solve fractional derivative diffusion equations involving fractional Laplacian operator. At last, some recent results and open issues on parameter determination methods for fractional diffusion models are offered.