

# **Fractional newton explicit group method for time-fractional nonlinear porous medium equations**

## **ABSTRACT**

This paper presents a fractional Newton explicit group method to solve time-fractional nonlinear porous medium equations. The presented method utilizes implicit finite difference schemes with the Caputo time-fractional derivative operator. This paper aims to evaluate the accuracy and efficiency of the proposed method in solving initial boundary value problems of porous medium equations at different orders of time-fractional derivatives. The method is experimented repeatedly by using several large systems of equations to illustrate the consistency of the method's performance. In addition, the method is also experimented in solving some physics problems, which can show the method's efficacy in solving realistic phenomena.