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**Mohsen Razzaghi\*** ([razzaghi@math.msstate.edu](mailto:razzaghi@math.msstate.edu)), Department of Mathematics and Statistics, Mississippi State University, Mississippi State, MS 39762. *Solution of fractional differential equations by polynomial series.*

Fractional differential equations (FDEs) are generalizations of ordinary differential equations to an arbitrary (non integer) order. FDEs have attracted considerable interest because of their ability to model complex phenomena. In this talk, a numerical method for solving the initial and boundary-value problems for FDEs is presented. The method is based upon the fractional polynomial series approximations. The operational matrix for the fractional polynomial series is given. This matrix is then utilized to reduce the solution of the FDEs to a system of algebraic equations. The method is computationally very attractive and gives very accurate results. The numerical solutions are compared with available exact or approximate solutions in order to assess the accuracy of the proposed method. (Received September 09, 2016)