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LA 70504. *Quenching in Two Dimensional Time Fractional Reaction-Diffusion Equation.*

We study the quenching problem for time Caputo-fractional reaction-diffusion equation with a nonlinear reaction term in a two-dimensional rectangular domain. In this work, we prove local existence and the quenching of the solution of Caputo fractional ordinary differential equation and Caputo fractional reaction-diffusion equation with a nonlinear reaction term in finite time. We establish the condition for quenching for the solution of the fractional ordinary differential equation and fractional reaction-diffusion equation. We also provide the upper bound for the quenching time of the solution of fractional ordinary and reaction-diffusion equation. The study of quenching behavior of the solution of fractional differential equation relies on the quenching behavior of the solution of integer order reaction-diffusion equation and method of upper and lower solution. (Received September 17, 2019)