

ON A PERTURBED FAST DIFFUSION EQUATION WITH DYNAMIC BOUNDARY CONDITIONS

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Abstract. This paper discusses finite time extinction for a perturbed fast diffusion equation with dynamic boundary conditions. The fast diffusion equation has the characteristic property of decay, such as the solution decays to zero in a finite amount of time depending upon the initial data. In the target problem, some p -th or q -th order perturbation term may work to blow up within this period. The problem arises from the conflict between the diffusion and the blow up, in the bulk and on the boundary. Firstly, the local existence and uniqueness of the solution are obtained. Finally, a result of finite time extinction for some small initial data is presented.

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