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Title: Multiplicative controllability for semilinear reaction-diffusion equations

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Abstract: We study the global approximate controllability properties of a one dimensional semilinear reaction-diffusion equation

$$u_t = u_{xx} + v(x,t)u + f(u)$$

where the control action is the coefficient of the reaction term. It is assumed that both the initial and target states admit no more than finitely many changes of sign. Our goal is to show that any target state, with as many changes of sign in the same order as the given initial data, can be approximately reached in the $L^2(0,1)$ -norm at some time $T > 0$.