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Cauchy-Neumann problem for a class of nondiagonal parabolic systems with quadratic growth nonlinearities I. On the continuability of smooth solutions

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Abstract: A class of nonlinear parabolic systems with quadratic nonlinearities in the gradient (the case of two spatial variables) is considered. It is assumed that the elliptic operator of the system has a variational structure. The behavior of a smooth on a time interval $[0, T)$ solution to the Cauchy-Neumann problem is studied. For the situation when the "local energies" of the solution are uniformly bounded on $[0, T)$, smooth extendibility of the solution up to $t = T$ is proved. In the case when $[0, T)$ defines the maximal interval of the existence of a smooth solution, the singular set at the moment $t = T$ is described.

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