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Globally classical solutions for nonlinear equations of first order. (English) Zbl 0594.35052
Commun. Partial Differ. Equations 10, 1451-1463 (1985).

Etant donné le problème différentiel:

$$(1) \quad \partial u / \partial t + f(t, x, u, Du) = 0$$

$(t, x) \in D = \{t > 0, x \in \mathbb{R}^N\}$, $u(0, x) = \phi(x)$, f et ϕ étant de classe C^2 . Si les solutions du problème:

$$dx_i/dt = \partial f(t, x, v, p) / \partial p_i, \quad dv/dt = \sum_{i=1}^N p_i \partial f / \partial p_i - f, \quad dp_i/dt = -\partial f / \partial x_i - p_i \partial f / \partial v$$

possèdent les bonnes propriétés. L'A. montre (Théorème 5) que (1) admet une unique solution de classe C^2 dans \bar{D} si et seulement si $(Dx/Dy)(t, y) \neq 0$ pour tout $(t, y) \in \bar{D}$.

Reviewer: [M.-T.Lacroix](#)

MSC:

- [35G10](#) Initial value problems for linear higher-order PDEs
- [35K25](#) Higher-order parabolic equations
- [35K55](#) Nonlinear parabolic equations
- [35A05](#) General existence and uniqueness theorems (PDE) (MSC2000)

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Keywords:

Cauchy problem; nonlinear evolution equations; singularities of; solutions; global classical solution

Full Text: [DOI](#)

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