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Nonlinear singular first order partial differential equations of Briot- Bouquet type. (English)

Zbl 0711.35034

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Die gewöhnliche Differentialgleichung vom Briot-Bouquet Typ [see *E. Hille*, Ordinary differential equations in the complex domain (1976; Zbl 0343.34007)] wird zu einer partiellen Differentialgleichung derart verallgemeinert, daß analoge Sätze wie im gewöhnlichen Fall gelten. Betrachtet wird

(*) $t \partial u / \partial t = F(t, x, u, \partial u / \partial x)$, wobei $t \in \mathbb{C}$, $x \in \mathbb{C}^n$, $\partial u / \partial x = (\partial u / \partial x_1, \dots, \partial u / \partial x_n)$ und u komplexwertig sind. Δ sei Nullumgebung in $\mathbb{C} \times \mathbb{C}^n \times \mathbb{C} \times \mathbb{C}^n$ und $\Delta_0 = \Delta \cap \{t = 0, u = 0, v = 0\}$. Es seien $F = F(t, x, u, v)$ holomorph in Δ , $F(0, x, 0, 0) = 0$ in Δ_0 , $(\partial F / \partial v_i)(0, x, 0, 0) = 0$ in Δ_0 ($i = 1, \dots, n$) und $\rho(x) = (\partial F / \partial u)(0, x, 0, 0)$. Es werden Bedingungen für Existenz und Eindeutigkeit holomorpher und singularer Lösungen in einer Nullumgebung von $\mathbb{C} \times \mathbb{C}^n$ formuliert, die $u(0, x) \equiv 0$ erfüllen.

Reviewer: A.Müller-Rettkowski

MSC:

35F25 Initial value problems for nonlinear first-order PDEs

35B65 Smoothness and regularity of solutions to PDEs

35A07 Local existence and uniqueness theorems (PDE) (MSC2000)

Cited in 2 Documents

Keywords:

equation of Briot-Bouquet type; holomorphic and singular solutions

Full Text: DOI

References:

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