

On the integration along characteristics

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Abstract

The aim of this paper is to integrate along the corresponding characteristics the last two equations of the canonical form of a second order hyperbolic equation.

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Let us consider second-order hyperbolic equation $u_{tt} = a^2 u_{xx} + bu_x + cu_t + du + F$, where the coefficients $b(x, t) = 0$ and $c(x, t) = 0$ are taken zero. In these circumstances we can establish the following result [1]: The equation

$$u_{tt} = a^2 u_{xx} + du + F$$

is equivalent with the system

$$r_t = Kr_x + Dr + \Phi,$$

where the new unknowns are given by the the following relations:

$$r_1 = u, r_2 = \frac{1}{2} \left(\frac{v}{a} + w \right), r_3 = \frac{1}{2} \left(\frac{v}{a} - w \right),$$

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