Approaching a partial differential equation of mixed elliptic-hyperbolic type *

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Abstract

We discuss a quasilinear second-order partial differential equation of mixed elliptic-hyperbolic type in two independent variables, which originates from a certain fully nonlinear system of first order partial differential equations. According to a theory of Kratsov and Ludwig, such a system is met by expanding near a caustic solutions to Helmholtz equation asymptotically for high frequencies.

Key words. Eikonal equation, Partial differential equations of mixed elliptic-hyperbolic type, Bäcklund transformations, Legendre transform.

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