On analyticity and smoothness of solutions of first-order nonlinear PDEs

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Abstract

We will discuss the microlocal analyticity and smoothness of solutions $u$ of the nonlinear PDE $u_t = f(x, t, u, u_x)$ under some assumptions on the repeated brackets of the linearized operator and its conjugate. The results are inspired by what is known for the tangential Cauchy Riemann vector fields. Applications include the instability of the Cauchy-Kovalevskaya solution for a class of nonlinear systems. For some of the results, we will use a new class of FBI transforms introduced recently in a joint paper with J. Hounie.

References


