

Lewy's example, a smooth linear PDE with no solution

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Abstract

It was long believed that any 'reasonable' partial differential equation, without boundary conditions imposed, should have many solutions. The surprise came in 1957. Hans Lewy gave an embarrassingly simple counter-example which showed that in this case the set of solutions may be empty.

In this talk we are going to discuss about the problem which is probably the most primitive in partial differential equations theory, namely to know whether an equation does, or does not, have a solution. In this context, the famous theorem, the Cauchy-Kovalevskaya theorem, will be introduced.